# Cisco TelePresence Video Communication Server (Cisco VCS) IP Port Usage for Firewall Traversal

Cisco VCS X8.2

D14606.06 DRAFT A

June 2014

Many of the new features described herein remain in varying stages of development and will be offered on a when-and-if-available basis. The features in the EFT and any future product release are subject to change at the sole discretion of Cisco. Accordingly, Cisco will have no liability for delay in the delivery or failure to deliver any future products or features described in this document and any such delay or failure would not in any way imply the right to return any previously purchased Cisco products.

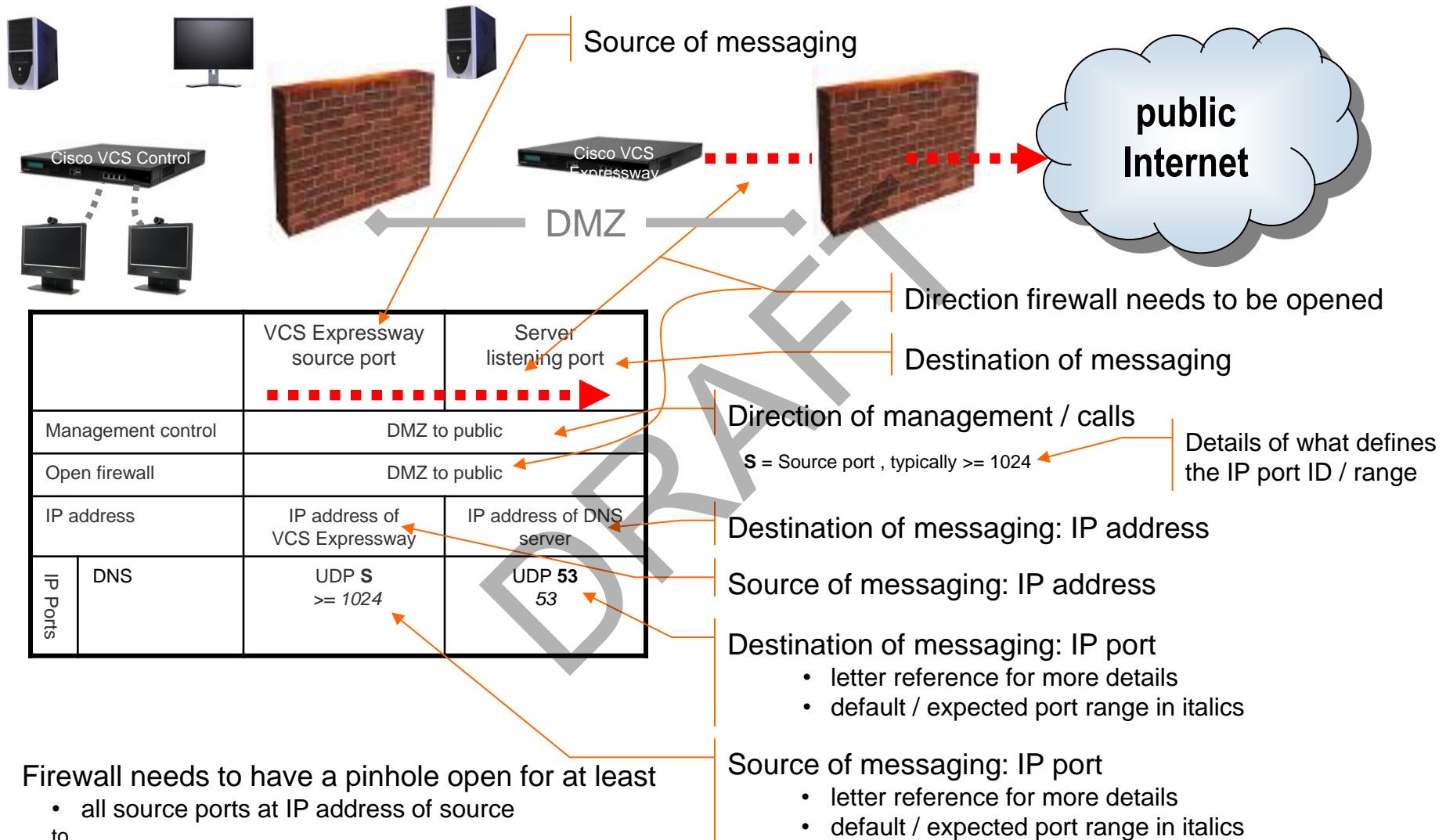# Contents: Cisco VCS IP port usage

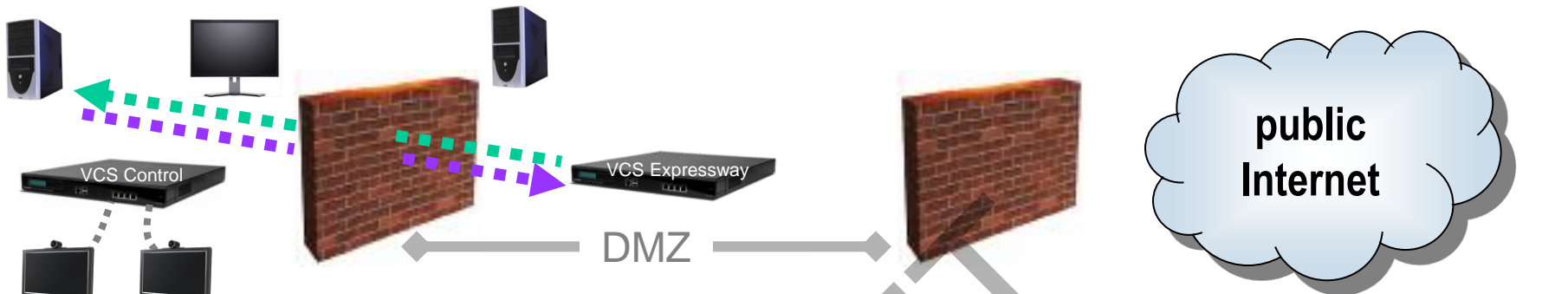Which IP ports are used with Cisco VCS?

Which IP ports need to be allowed through firewalls?

- Format of information
- Traversing firewalls
  - Administration
  - SIP calls
  - H.323 calls
- Internal
  - Administration
  - SIP calls
  - H.323 calls

# Guide to this document: format of information

Source of messaging

**public Internet**
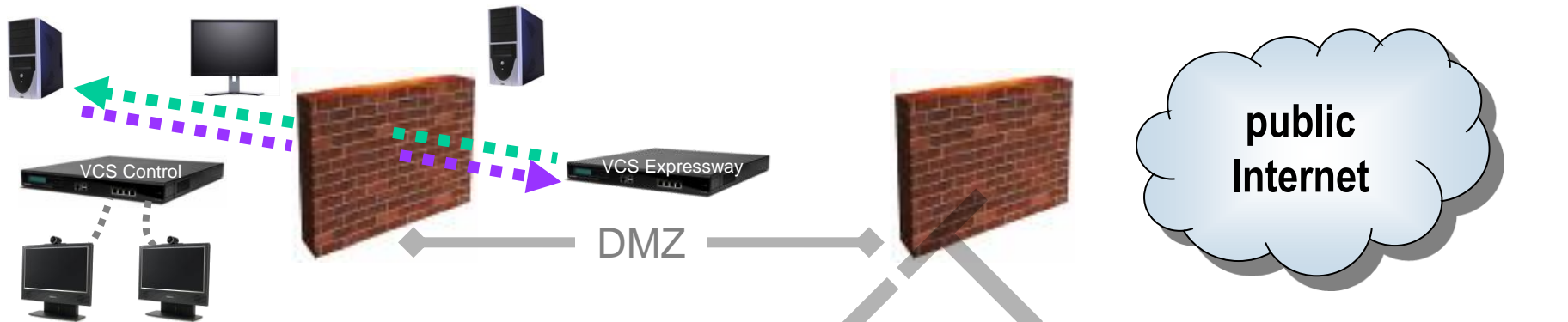
Cisco VCS Control

Cisco VCS Expressway

DMZ

Direction firewall needs to be opened

Destination of messaging

Direction of management / calls

**S** = Source port , typically >= 1024

Details of what defines the IP port ID / range

Destination of messaging: IP address

Source of messaging: IP address

Destination of messaging: IP port
- letter reference for more details
- default / expected port range in italics

Source of messaging: IP port
- letter reference for more details
- default / expected port range in italics

| | VCS Expressway source port | Server listening port |
|---|---|---|
| Management control | DMZ to public | |
| Open firewall | DMZ to public | |
| IP address | IP address of VCS Expressway | IP address of DNS server |
| IP Ports — DNS | UDP **S** >= *1024* | UDP **53** *53* |

Firewall needs to have a pinhole open for at least
- all source ports at IP address of source

to
- all listening ports at IP address of listener

When a firewall allows an outbound message through, it is assumed that responses (up to about 20 to 30 seconds after the original send) will be allowed back through the firewall

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# Administration: Cisco VCS Expressway



| | Management system source port | VCS Expressway server (listening) port |
|---|---|---|
| Management control | Private to DMZ | |
| Open firewall | Private to DMZ | |
| IP address | IP address of management computer(s) | IP address of VCS Expressway |
| IP Ports — http | TCP **S** >= 1024 | TCP **80** 80 |
| IP Ports — https | TCP **S** >= 1024 | TCP **443** 443 |
| IP Ports — ssh | TCP **S** >= 1024 | TCP **22** 22 |
| IP Ports — SNMP | UDP **S** >= 1024 | UDP **161** 161 |

public Internet

DMZ

Management ports
… only open ports for the management methods to be used

**S** = Source port , typically >= 1024

VCS Control

VCS Expressway

# Administration: Cisco VCS Expressway



Management ports
… only open ports for the management methods to be used

| | PC listening port | VCS Expressway source port |
|---|---|---|
| Management control | DMZ to private | |
| Open firewall | DMZ to private | |
| IP address | IP address of management computer(s) | IP address of VCS Expressway |
| NTP | UDP **123** *123* | UDP **123** *123* |
| LDAP (for login) | TCP **389 or 636** *389 or 636* | TCP **Ue** *30000 to 35999 \** |
| Syslog | *UDP* **514** *514* | *UDP* **Ve** *30000 to 35999 \** |

(IP Ports)
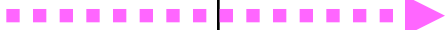
**Ue** = VCS TCP ephemeral port range defaults to 30000 to 35999 *

**Ve** = VCS UDP ephemeral port range defaults to 30000 to 35999 *

\* The default ephemeral port range of 30000 – 35999 applies to new installations of X8.1 or later; the previous default range of 40000 - 49999 still applies to earlier releases that have upgraded to X8.1.

# Administration: Cisco VCS Expressway
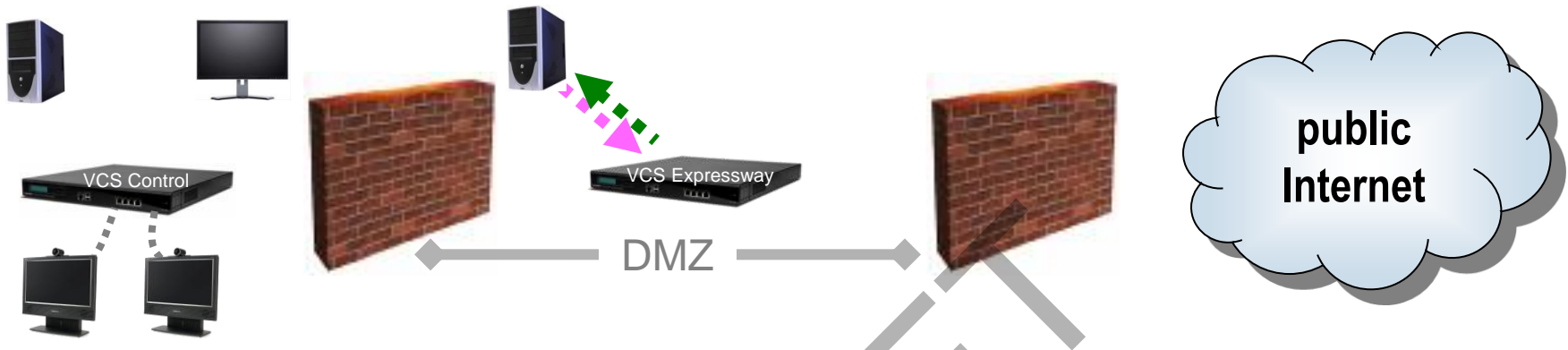


| | | TMS source port | VCS Expressway (listening) port | TMS (listening) port | VCS Expressway source port |
|---|---|---|---|---|---|
| Call direction | | TMS to VCS Expressway | | VCS Expressway to TMS | |
| Open firewall | | n/a | | n/a | |
| IP address | | External IP address of TMS | IP address of VCS Expressway | External IP address of TMS | IP address of VCS Expressway |
| IP Ports | https (TMS to VCS and secure feedback from VCS to TMS) | TCP **S** *>= 1024* | TCP **443** *443* | TCP **443** *443* | TCP **S** *>= 1024* |
| | http (feedback to TMS) | - | - | TCP **80** *80* | TCP **S** *>= 1024* |
| | SNMP (To TMS) | UDP **S** *>= 1024* | UDP **161** *161* | | |

**S** = Source port , typically >= 1024

# Administration: Cisco VCS Expressway



|  |  | VCS Expressway source port | Server listening port |
|---|---|---|---|
| Management control |  | DMZ to public | |
| Open firewall |  | DMZ to public | |
| IP address |  | IP address of VCS Expressway | IP address of DNS Server |
| IP Ports | DNS | UDP **S** >= *1024* | UDP **53** *53* |

**S** = Source port , typically >= 1024

# SIP traversal call



| | VCS Control source port | VCS Expressway server (listening) port |
|---|---|---|
| Call direction | Inbound and outbound calls | |
| Open firewall | Private to DMZ | |
| IP address | IP address of VCS Control | IP address of VCS Expressway |
| IP Ports — SIP signaling | TCP & TLS **A** *25000 to 29999* | TCP and TLS **B** *7001* |
| IP Ports — Assent RTP (traversal media) | UDP $Y_C$ *36002 to 59999 \*\** | UDP $Y_E$ *36000 to 36001 \*\*\** |
| IP Ports — Assent RTCP (traversal media) | UDP $Y_C$ *36002 to 59999 \*\** | UDP $Y_E$ *36000 to 36001 \*\*\** |

**A** = Protocols > SIP > TCP Outbound port start to end: *default = 25000 to 29999*

**B** = Zones > Traversal Client > SIP port, typically *7001* for first traversal zone, *7002* for second etc.

$Y_C$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Control): *default = 36000 to 59999 \*\**
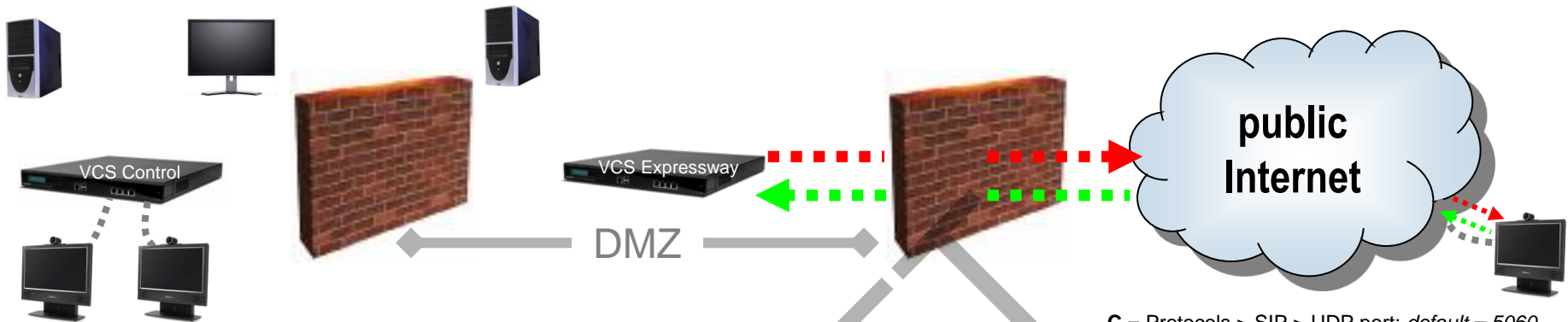
$Y_E$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway): *default = 36000 to 59999 \*\* / \*\*\**

\*\* The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

\*\*\* Systems prior to X8 that are upgraded to X8.2 or later will continue to use the previous media demultiplexing RTP /RTCP ports, typically 2776/2777.

# SIP call to endpoint with public IP address

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DMZ

**public Internet**

VCS Control

VCS Expressway

| | VCS Expressway source port | Internet endpoint server (listening) port | VCS Expressway server (listening) port | Internet endpoint source port |
|---|---|---|---|---|
| Call direction | Outbound to an endpoint in the Internet | | Inbound from an endpoint in the Internet | |
| Open firewall | DMZ to Internet | | Internet to DMZ | |
| IP address | IP address of VCS Expressway | Any IP address | IP address of VCS Expressway | Any IP address |
| IP Ports — SIP signaling | UDP **C** *5060* TCP & TLS **A** *25000 to 29999* | UDP & TCP & TLS **F** *5060 or >= 1024* | UDP: **C** *5060* TCP: **K** *5060* TLS: **L** *5061* | UDP **G** *5060 or >= 1024* TCP & TLS **H** *>= 1024* |
| IP Ports — RTP | UDP **Y$_E$** *36002 to 59998 \*\** | UDP **E** *>= 1024* | UDP **Y$_E$** *36002 to 59998 \*\** | UDP **E** *>= 1024* |
| IP Ports — RTCP | UDP **Y$_E$** *36003 to 59999 \*\** | UDP **E** *>= 1024* | UDP **Y$_E$** *36003 to 59999 \*\** | UDP **E** *>= 1024* |

**C** = Protocols > SIP > UDP port: *default = 5060*

**A** = Protocols > SIP > TCP Outbound port start to end: *default = 25000 to 29999*

**F** = defined by endpoint's registration (or not registered, IP port is defined by DNS lookup) any port *>= 1024*, often 5060 for UDP

**K** = Protocols > SIP > TCP port: *default = 5060*

**L** = Protocols > SIP > TLS port: *default =5061*

**G** = any port *>= 1024*, often 5060 for hard endpoints

**H** = any port *>= 1024*

**Y$_E$** = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway): *default = 36000 to 59999 \*\**

**E** = Endpoint media port range; value used is specified in the SDP:
= *any IP port above 1024*
= 36000 to 59999 \*\* for another VCS
= 2326 to 2385 for MXP static setting
= 11000 to 65000 for MXP dynamic setting

\*\* The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

# SIP call to endpoint behind non SIP-aware firewall
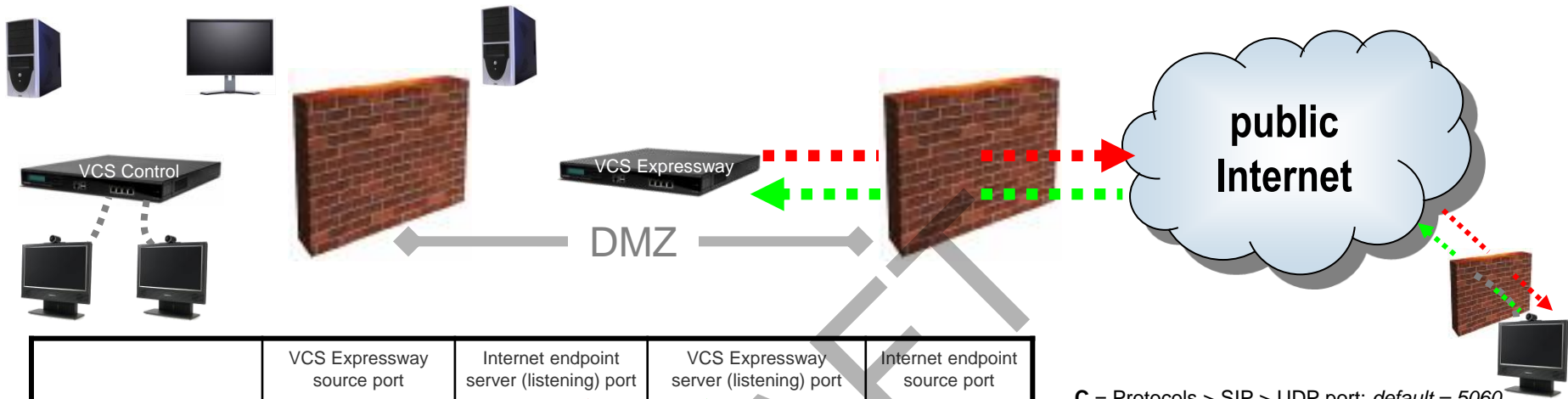


| | | VCS Expressway source port | Internet endpoint server (listening) port | VCS Expressway server (listening) port | Internet endpoint source port |
|---|---|---|---|---|---|
| Call direction | | Outbound to an endpoint behind a firewall | | Inbound from an endpoint behind a firewall | |
| Open firewall | | DMZ to Internet | | Internet to DMZ | |
| IP address | | IP address of VCS Expressway | Any IP address | IP address of VCS Expressway | Any IP address |
| IP Ports | SIP signaling | UDP **C** *5060* TCP & TLS **A** *25000 to 29999* | UDP & TCP & TLS **F** *5060 or >= 1024* | UDP: **C** *5060* TCP: **K** *5060* TLS: **L** *5061* | UDP, TCP & TLS: **Q** *>= 1024* |
| | RTP | UDP **Y$_E$** *36002 to 59998 \*\** | UDP **N** *>= 1024* | UDP **Y$_E$** *36002 to 59998 \*\** | UDP **N** *>= 1024* |
| | RTCP | UDP **Y$_E$** *36003 to 59999 \*\** | UDP **N** *>= 1024* | UDP **Y$_E$** *36003 to 59999 \*\** | UDP **N** *>= 1024* |

**C** = Protocols > SIP > UDP port: *default = 5060*

**A** = Protocols > SIP > TCP Outbound port start to end: *default = 25000 to 29999*

**F** = defined by endpoint's registration (or if call is to a non registered endpoint, IP port is defined by DNS lookup) any port *>= 1024*, often 5060 for UDP

**K** = Protocols > SIP > TCP port: *default = 5060*

**L** = Protocols > SIP > TLS port: *default =5061*

**Q** = Egress IP port from far end non-NAT aware firewall: any port *>= 1024*

**Y$_E$** = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway): *default = 36000 to 59999 \*\**

**N** = VCS waits until it receives media, then it sends its media to the IP port from which the media was received (egress port of the media from the far end non SIP-aware firewall): any port *>= 1024*

\*\* The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

# SIP – additional ports for ICE
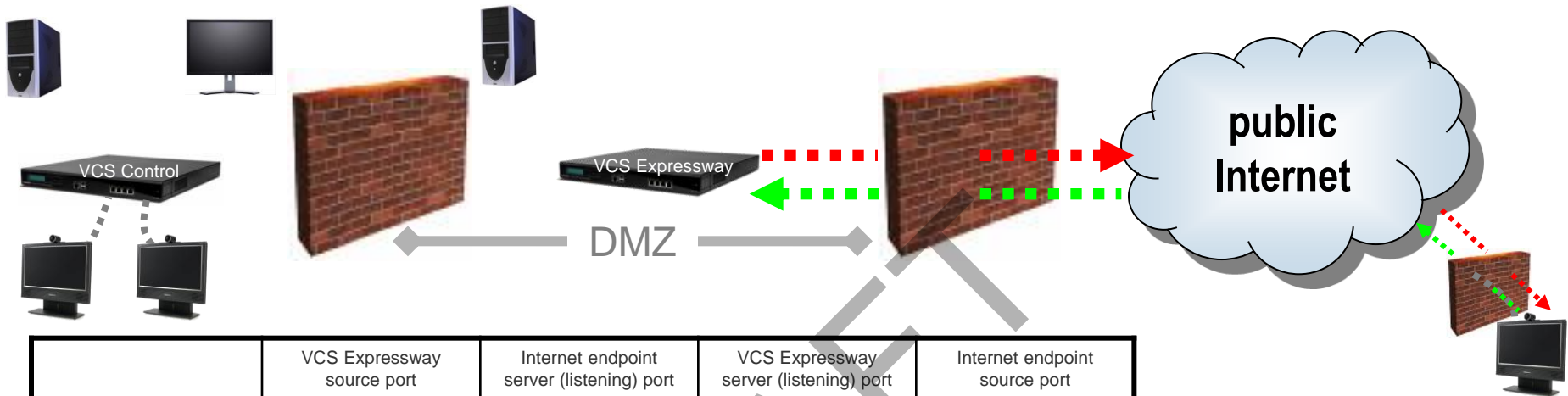


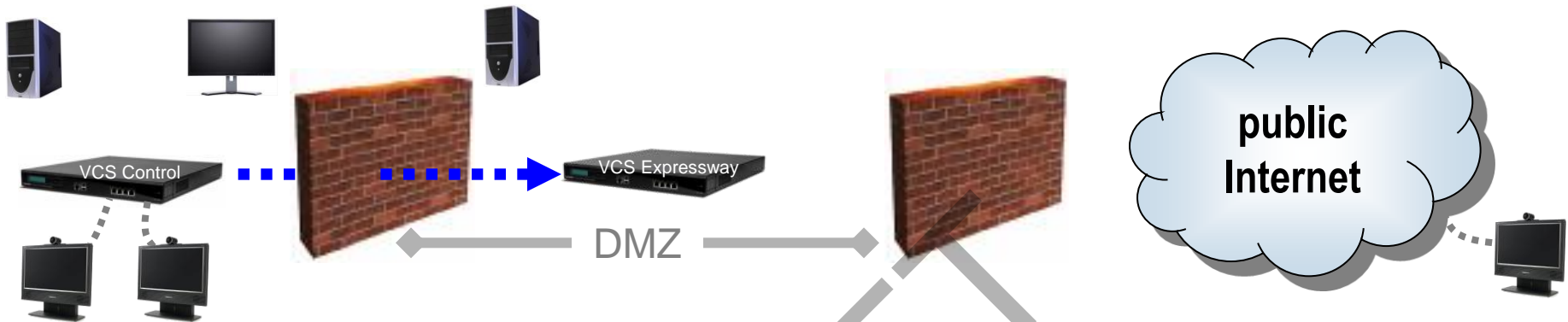| | VCS Expressway source port | Internet endpoint server (listening) port | VCS Expressway server (listening) port | Internet endpoint source port |
|---|---|---|---|---|
| message direction | Outbound from VCS to endpoint in internet | | Inbound from an endpoint in internet to VCS | |
| Open firewall | DMZ to Internet | | Internet to DMZ | |
| IP address | IP address of VCS Expressway | Any IP address | IP address of VCS Expressway | Any IP address |
| IP Ports — TURN server control | N/A | N/A | UDP **R** *3478 (to 3483)* | UDP **M** *>= 1024* |
| IP Ports — TURN server media | UDP *24000 to 29999 \** | UDP **N** *>= 1024* | UDP *24000 to 29999 \** | UDP **N** *>= 1024* |

**M** = IP port of signalling from endpoint – may be ephemeral IP port of endpoint (if no firewall), or IP port of the outside firewall :
= *any IP port above 1024*

**N** = IP port of relevant ICE candidate – host IP port, Server reflexive IP port (outside firewall port) or TURN server port:
= *any IP port above 1024*

**R** = On Large VCS systems you can configure a range of TURN request listening ports

\* For new installations of X8.1 or later, the default range for TURN relay media ports is 24000 – 29999. The previous default range of 60000 – 61799 still applies to earlier releases that have upgraded to X8.1.

# H.323 traversal call using Assent



| | VCS Control source port | VCS Expressway server (listening) port |
|---|---|---|
| Call direction | Inbound and outbound calls | |
| Open firewall | Private to DMZ | |
| IP address | IP address of VCS Control | IP address of VCS Expressway |
| Initial RAS connection | UDP $R_C$ *1719* | UDP **D** *6001* |
| Q 931 / H.225 signaling | TCP **P** *15000 to 19999* | TCP **T** *2776* |
| H.245 | TCP **P** *15000 to 19999* | TCP **T** *2776* |
| Assent RTP (traversal media) | UDP $Y_C$ *36002 to 59998 \** | UDP $Y_E$ *36000 \*\*\** |
| Assent RTCP (traversal media) | UDP $Y_C$ *36003 to 59999 \** | UDP $Y_E$ *36001 \*\*\** |

*IP Ports* (row label spanning the lower rows)

$R_C$ = Protocols > H.323 > Gatekeeper > Registration UDP port: *default = 1719*

**P** = Protocols > H.323 > Gatekeeper > Call signaling port range start to end: *default = 15000 to 19999*

**D** = Zones > Traversal Zone > H.323 port, typically *6001* for first traversal zone, 6002 for second etc.

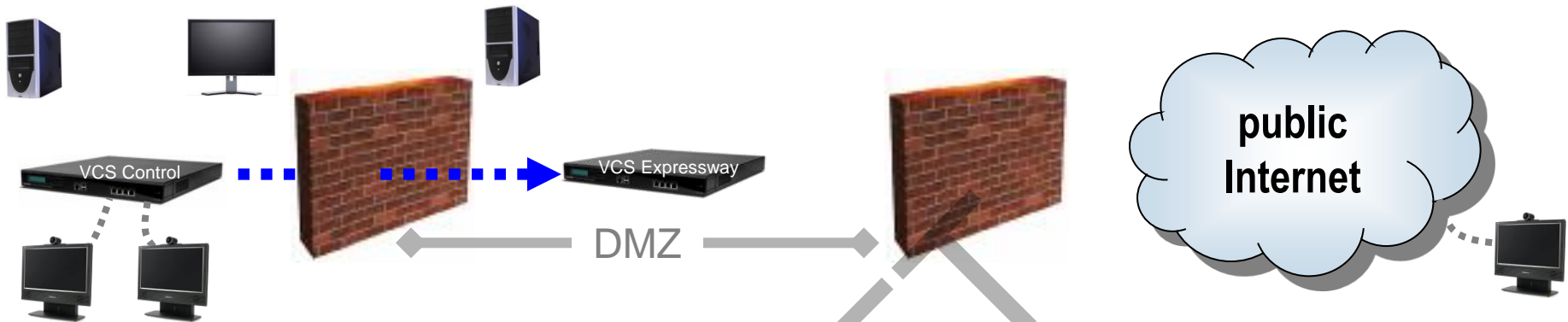**T** = Traversal > Ports > H.323 Assent call signaling port: *default = 2776*

$Y_C$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Control): *default = 36000 to 59999 \*\**

$Y_E$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway): *default = 36000 to 59999 \*\* / \*\*\**

\*\* The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

\*\*\* Systems prior to X8 that are upgraded to X8.2 or later will continue to use the previous media demultiplexing RTP /RTCP ports, typically 2776/2777.

# H.323 traversal call using H.460.18 / 19 non-muxed media



| | VCS Control source port | VCS Expressway server (listening) port |
|---|---|---|
| Call direction | Inbound and outbound calls | |
| Open firewall | Private to DMZ | |
| IP address | IP address of VCS Control | IP address of VCS Expressway |
| **IP Ports** — Initial RAS connection | UDP $R_C$ *1719* | UDP **D** *6001* |
| Q 931 / H.225 signaling | TCP **P** *15000 to 19999* | TCP **M** *1720* |
| H.245 | TCP **P** *15000 to 19999* | TCP **U** *2777* |
| Assent RTP (traversal media) | UDP $Y_C$ *36002 to 59998 \*\** | UDP $Y_E$ *36002 to 59998 \*\** |
| Assent RTCP (traversal media) | UDP $Y_C$ *36003 to 59999 \*\** | UDP $Y_E$ *36003 to 59999 \*\** |

$R_C$ = Protocols > H.323 > Gatekeeper > Registration UDP port: *default = 1719*

**P** = Protocols > H.323 > Gatekeeper > Call signaling port range start to end: *default = 15000 to 19999*

**D** = Zones > Traversal Zone > H.323 port, typically *6001* for first traversal zone, 6002 for second etc.

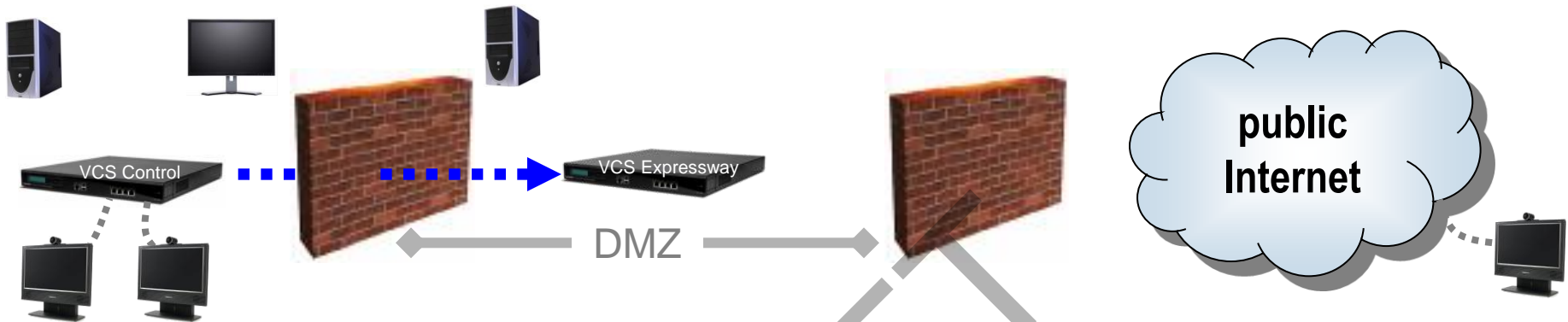**M** = Protocols > H.323 Call signaling TCP port: *default = 1720*

**U** = Traversal > Ports > H.323 H.460.18 call signaling port: *default = 2777*

$Y_C$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Control): *default = 36000 to 59999 \*\**

$Y_E$ = Local Zone < Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway) : *default = 36000 to 59999 \*\**

\*\* The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

# H.323 traversal call using H.460.18 / 19 multiplexed media



| | VCS Control source port | VCS Expressway server (listening) port |
|---|---|---|
| Call direction | Inbound and outbound calls | |
| Open firewall | Private to DMZ | |
| IP address | IP address of VCS Control | IP address of VCS Expressway |
| **IP Ports** — Initial RAS connection | UDP $R_C$ *1719* | UDP **D** *6001* |
| Q 931 / H.225 signaling | TCP **P** *15000 to 19999* | TCP **M** *1720* |
| H.245 | TCP **P** *15000 to 19999* | TCP **U** *2777* |
| Assent RTP (traversal media) | UDP $Y_C$ *36002 to 59998 \*\** | UDP $Y_E$ *36000 \*\*\** |
| Assent RTCP (traversal media) | UDP $Y_C$ *36003 to 59999 \*\** | UDP $Y_E$ *36001 \*\*\** |

$R_C$ = Protocols > H.323 > Gatekeeper > Registration UDP port: *default = 1719*

**P** = Protocols > H.323 > Gatekeeper > Call signaling port range start to end: *default = 15000 to 19999*

**D** = Zones > Traversal Zone > H.323 port, typically *6001* for first traversal zone, 6002 for second etc.

**M** = Protocols > H.323 Call signaling TCP port: *default = 1720*

**U** = Traversal > Ports > H.323 H.460.18 call signaling port: *default = 2777*

$Y_C$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Control): *default = 36000 to 59999 \*\**
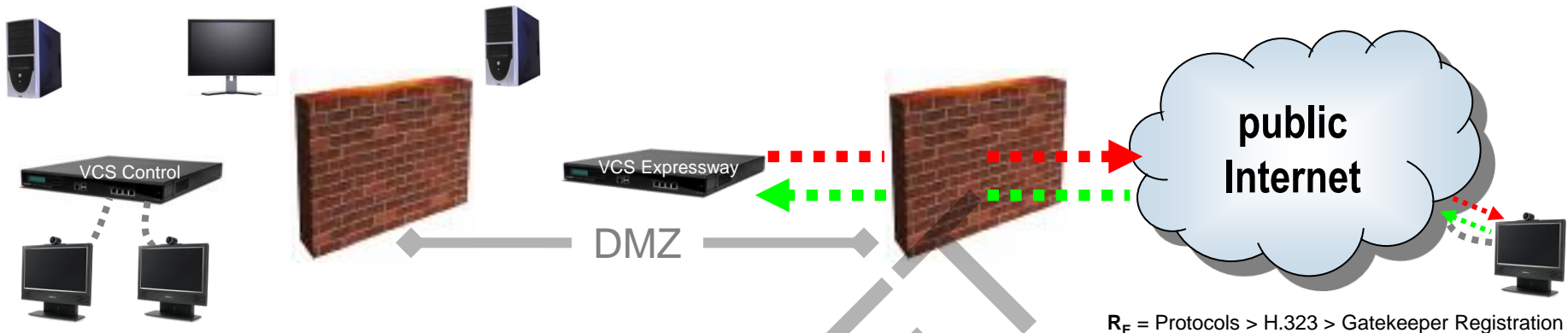
$Y_E$ = Local Zone < Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway) : *default = 36000 to 59999 \*\* / \*\*\**

\*\* The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

\*\*\* Systems prior to X8 that are upgraded to X8.2 or later will continue to use the previous media demultiplexing RTP /RTCP ports, typically 2776/2777.

# H.323 call with registered endpoint with public IP address



| | VCS Expressway source port | Internet endpoint server (listening) port | VCS Expressway server (listening) port | Internet endpoint source port |
|---|---|---|---|---|
| Call direction | Outbound to an endpoint in the Internet | | Inbound from an endpoint in the Internet | |
| Open firewall | DMZ to Internet | | Internet to DMZ | |
| IP address | IP address of VCS Expressway | Any IP address | IP address of VCS Expressway | Any IP address |
| Initial RAS connection | - | - | UDP $R_E$ *1719* | UDP **J** *1719* |
| Q 931 / H.225 signaling | TCP **P** *15000 to 19999* | TCP **G** *1720* | TCP **M** *1720* | TCP **K** *1720* |
| H.245 | TCP **P** *15000 to 19999* | TCP **H** *>= 1024* | TCP **P** *15000 to 19999* | TCP **H** *>= 1024* |
| RTP | UDP $Y_E$ *36000 to 59998 ** | UDP **E** *>= 1024* | UDP $Y_E$ *36000 to 59998 ** | UDP **E** *>= 1024* |
| RTCP | UDP $Y_E$ *36001 to 59999 ** | UDP **E** *>= 1024* | UDP $Y_E$ *36001 to 59999 ** | UDP **E** *>=1024* |

(IP Ports)

$R_E$ = Protocols > H.323 > Gatekeeper Registration > UDP port, *default = 1719*

**J** = Endpoint RAS source port, typically *1719*

**P** = Protocols > H.323 > Gatekeeper > Call signaling port range start to end: *default = 15000 to 19999*

**G** = Endpoint signaling port, specified in registration: any port >= 1024, typically *1720*

**M** = Protocols > H.323 Call signaling TCP port: *default = 1720*

**K** = Endpoint signaling port: any port >= 1024, typically *1720*

**H** = Endpoint H.245 signaling port:
= any IP port >= *1024*
= 15000 to 19999 to another VCS
= 5555 to 5574 for MXP static setting
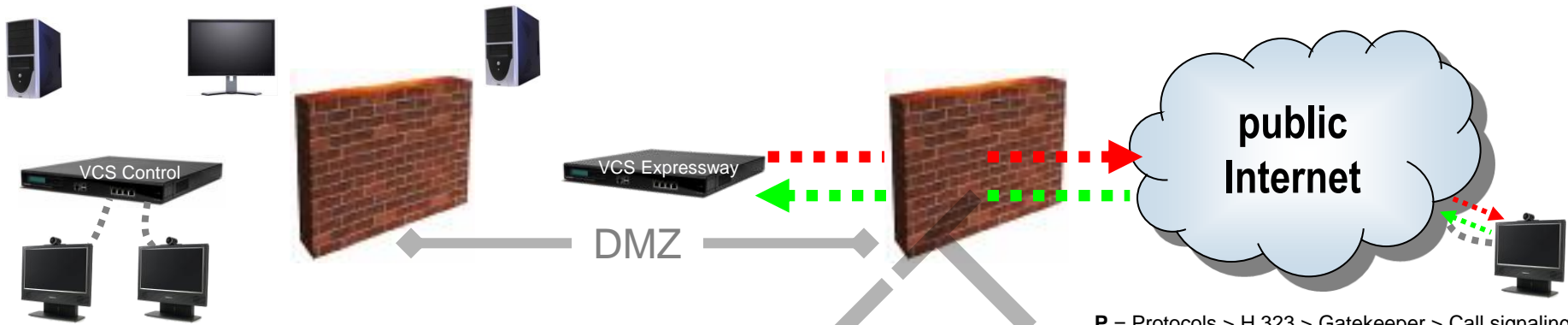= 11000 to 65000 for MXP dynamic setting

$Y_E$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway): *default = 36000 to 59999 ***

**E** = Endpoint media port range; value used is specified in codec negotiations:
= *any IP port above 1024*
= *36000 to 59999 ** for another VCS*
= 2326 to 2385 for MXP static setting
= 11000 to 65000 for MXP dynamic setting

** The default media port range of 36000 – 59999 applies to new installations of X8.1 or later; the previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1.

# H.323 call with a non-registered endpoint with public IP

DMZ

public Internet

VCS Control

VCS Expressway

| | VCS Expressway source port | Internet endpoint server (listening) port | VCS Expressway server (listening) port | Internet endpoint source port |
|---|---|---|---|---|
| Call direction | Outbound to an endpoint in the Internet | | Inbound from an endpoint in the Internet | |
| Open firewall | DMZ to Internet | | Internet to DMZ | |
| IP address | IP address of VCS Expressway | Any IP address | IP address of VCS Expressway | Any IP address |
| **Initial RAS connection** | - | - | - | - |
| **Q 931 / H.225 signaling** | TCP **P** *15000 to 19999* | TCP **G** *1720* | TCP **M** *1720* | TCP **K** *1720* |
| **H.245** | TCP **P** *15000 to 19999* | TCP **H** *>= 1024* | TCP **P** *15000 to 19999* | TCP **H** *>= 1024* |
| **RTP** | UDP $Y_E$ *36000 to 59998 ** * | UDP **E** *>= 1024* | UDP $Y_E$ *36000 to 59998 ** * | UDP **E** *>= 1024* |
| **RTCP** | UDP $Y_E$ *36001 to 59999 ** * | UDP **E** *>= 1024* | UDP $Y_E$ *36001 to 59999 ** * | UDP **E** *>=1024* |

(IP Ports)

**P** = Protocols > H.323 > Gatekeeper > Call signaling port range start to end: *default = 15000 to 19999*

**G** = Endpoint signaling port, specified by
a) IP Port in call request
b) DNS lookup for URI to call
c) 1720 if IP address but no port specified
Can be: any port >= 1024, typically *1720*

**M** = Protocols > H.323 Call signaling TCP port: *default = 1720*

**K** = Endpoint signaling port: any port >= 1024, typically *1720*

**H** = Endpoint H.245 signaling port:
= any IP port >= *1024*
= 15000 to 19999 to another VCS
= 5555 to 5574 for MXP static setting
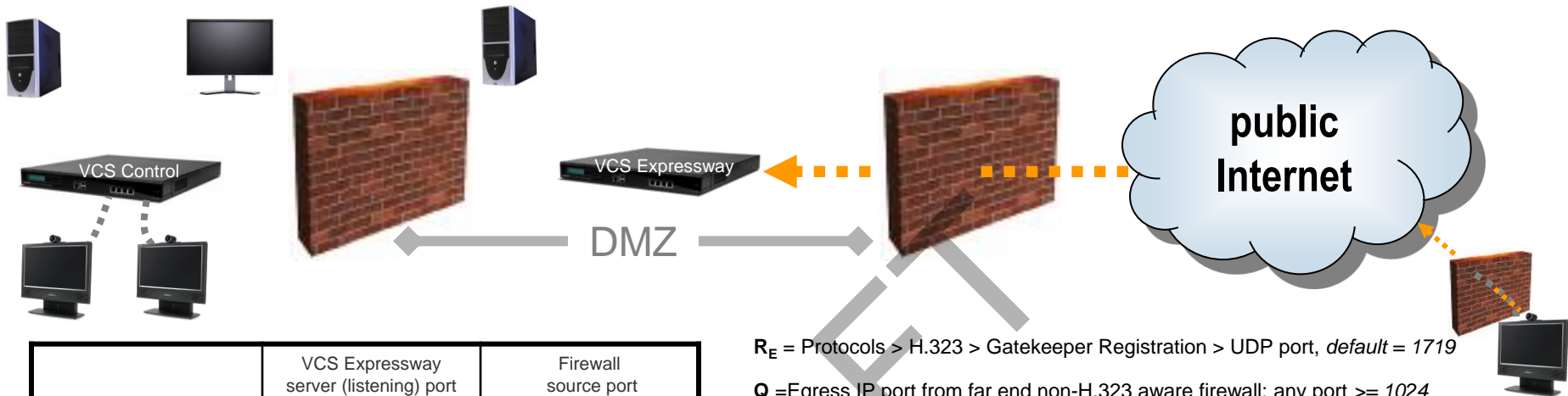= 11000 to 65000 for MXP dynamic setting

$Y_E$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway): *default = 36000 to 59999 ** *

**E** = Endpoint media port range; value used is specified in codec negotiations:
= *any IP port above 1024*
= *36000 to 59999 ** * for another VCS
= 2326 to 2385 for MXP static setting
= 11000 to 65000 for MXP dynamic setting

** The default media port range of 36000 – 59999 applies to new installations of X8.1 or later; the previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1.

# H.323 call with endpoint supporting Assent behind firewall



| | VCS Expressway server (listening) port | Firewall source port |
|---|---|---|
| Call direction | Inbound from or outbound to an endpoint in the Internet behind a firewall | |
| Open firewall | Internet to DMZ | |
| IP address | IP address of VCS Expressway | Any IP address |
| Initial RAS connection | UDP $R_E$ *1719* | UDP $Q$ *>=1024* |
| Q 931 / H.225 signaling | TCP $T$ *2776* | TCP $Q$ *>=1024* |
| H.245 | TCP $T$ *2776* | TCP $Q$ *>=1024* |
| RTP | UDP $Y_E$ *36000 ** / *** | UDP $N$ *>=1024* |
| RTCP | UDP $Y_E$ *36001 ** / *** | UDP $N$ *>=1024* |

(IP Ports)

$R_E$ = Protocols > H.323 > Gatekeeper Registration > UDP port, *default = 1719*

$Q$ = Egress IP port from far end non-H.323 aware firewall: any port *>= 1024*

$T$ = Traversal > Ports > H.323 Assent call signaling port: *default = 2776*

$Y_E$ = Local Zone < Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway) : *default = 36000 to 59999 ** / ***

$N$ = Egress IP port of media from far end non-H.323 aware firewall: any port *>= 1024*
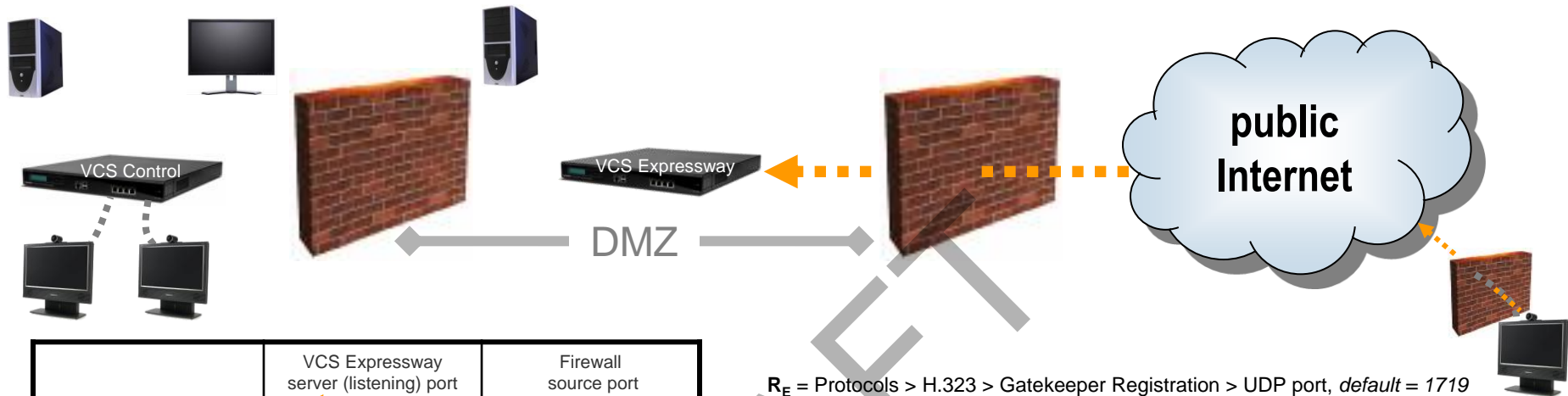
For calls made from the VCS Expressway to the endpoint:

1. VCS Expressway sends a message to the endpoint using the return path of the established RAS (registration) connection
2. The endpoint then makes a TCP connection out through its firewall to the VCS Expressway (port $T$ - 2776 must be open on the firewall local to the VCS Expressway)
3. Any further connections required (e.g. H.245) are requested by the VCS Expressway over the established TCP connection, and the endpoint initiates them (to port $T$ - 2776)

** The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

*** Systems prior to X8 that are upgraded to X8.2 or later will continue to use the previous media demultiplexing RTP /RTCP ports, typically 2776/2777.

# H.323 call with endpoint supporting H.460.18 / 19 non-mux media



|  | VCS Expressway server (listening) port | Firewall source port |
|---|---|---|
| Call direction | Inbound from or outbound to an endpoint in the Internet behind a firewall | |
| Open firewall | Internet to DMZ | |
| IP address | IP address of VCS Expressway | Any IP address |
| Initial RAS connection | UDP $R_E$ *1719* | UDP $Q$ *>=1024* |
| Q 931 / H.225 signaling | TCP $M$ *1720* | TCP $Q$ *>=1024* |
| H.245 | TCP $U$ *2777* | TCP $Q$ *>=1024* |
| RTP | UDP $Y_E$ *36002 to 59998 \*\** | UDP $N$ *>=1024* |
| RTCP | UDP $Y_E$ *36003 to 59999 \*\** | UDP $N$ *>=1024* |

(IP Ports)

$R_E$ = Protocols > H.323 > Gatekeeper Registration > UDP port, *default = 1719*

$Q$ =Egress IP port from far end non-H.323 aware firewall: any port *>= 1024*

$M$ = Protocols > H.323 Call signaling TCP port: *default = 1720*

$U$ = Traversal > Ports > H.323 H.460.18 call signaling port: *default = 2777*

$Y_E$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway): *default = 36000 to 59999 \*\**
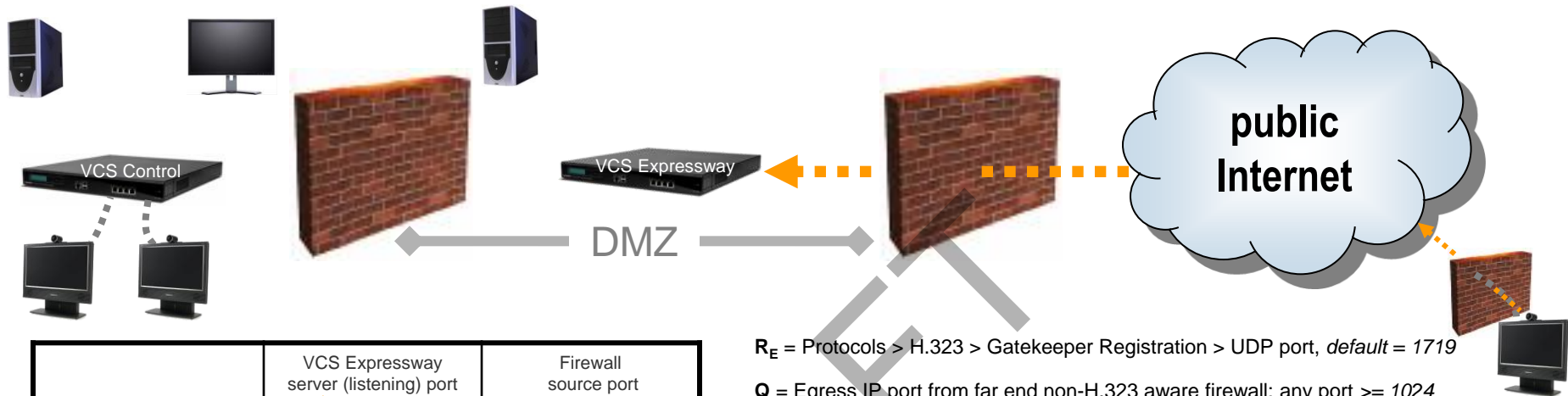
$N$ = Egress IP port of media from far end non-H.323 aware firewall: any port *>= 1024*

For calls made from the VCS Expressway to the endpoint:

1. VCS Expressway sends a message to the endpoint using the return path of the established RAS (registration) connection
2. The endpoint then makes a TCP connection out through its firewall to the VCS Expressway (port $M$ - 1720 must be open on the firewall local to the VCS Expressway)
3. Any further connections required (e.g. H.245) are requested by the VCS Expressway over the established TCP connection, and the endpoint initiates them (to port $U$ - 2777)

\*\* The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

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# H.323 call with endpoint supporting H460.18 / 19 multiplexed media



| | VCS Expressway server (listening) port | Firewall source port |
|---|---|---|
| Call direction | Inbound from or outbound to an endpoint in the Internet behind a firewall | |
| Open firewall | Internet to DMZ | |
| IP address | IP address of VCS Expressway | Any IP address |
| IP Ports — Initial RAS connection | UDP $R_E$ *1719* | UDP $Q$ *>=1024* |
| IP Ports — Q 931 / H.225 signaling | TCP $M$ *1720* | TCP $Q$ *>=1024* |
| IP Ports — H.245 | TCP $U$ *2777* | TCP $Q$ *>=1024* |
| IP Ports — RTP | UDP $Y_E$ *36000 ** / *** | UDP $N$ *>=1024* |
| IP Ports — RTCP | UDP $Y_E$ *36001 ** / *** | UDP $N$ *>=1024* |

$R_E$ = Protocols > H.323 > Gatekeeper Registration > UDP port, *default = 1719*

$Q$ = Egress IP port from far end non-H.323 aware firewall: any port *>= 1024*

$M$ = Protocols > H.323 Call signaling TCP port: *default = 1720*

$U$ = Traversal > Ports > H.323 H.460.18 call signaling port: *default = 2777*

$Y_E$ = Local Zone < Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway) : *default = 36000 to 59999 ***

$N$ = Egress IP port of media from far end non-H.323 aware firewall: any port *>= 1024*
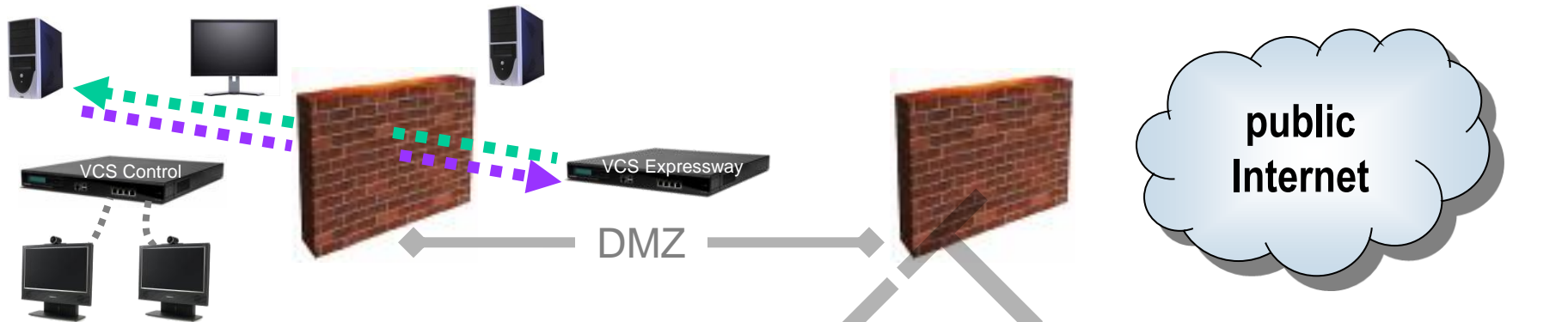
For calls made from the VCS Expressway to the endpoint:

1. VCS Expressway sends a message to the endpoint using the return path of the established RAS (registration) connection
2. The endpoint then makes a TCP connection out through its firewall to the VCS Expressway (port $M$ - 1720 must be open on the firewall local to the VCS Expressway)
3. Any further connections required (e.g. H.245) are requested by the VCS Expressway over the established TCP connection, and the endpoint initiates them (to port $U$ - 2777)

** The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

*** Systems prior to X8 that are upgraded to X8.2 or later will continue to use the previous media demultiplexing RTP /RTCP ports, typically 2776/2777.

# SIP/H.323 Authentication: Cisco VCS Expressway



**public Internet**

DMZ

Management ports
… only open ports for the management methods to be used

| | | PC listening port | VCS Expressway source port |
|---|---|---|---|
| Management control | | DMZ to private | |
| Open firewall | | DMZ to private | |
| IP address | | IP address of management computer(s) | IP address of VCS Expressway |
| IP Ports | H.350 | TCP **389 or 636** <br> *389 or 636* | TCP **Ue** <br> *30000 to 35999 \** |
| | Active Directory direct | UDP **53** <br> UDP **88** <br> TCP **88** <br> UDP **389** <br> TCP **389 or 636** <br> TCP **445 or 139** <br> *53, 88, 389 or 636, 445 or 139* | UDP **Ve** <br> *30000 to 35999 \** <br> TCP **Ue** <br> *30000 to 35999 \** |

**Ue** = VCS TCP ephemeral port range defaults to 30000 to 35999 *

**Ve** = VCS UDP ephemeral port range defaults to 30000 to 35999 *

\* The default ephemeral port range of 30000 – 35999 applies to new installations of X8.1 or later; the previous default range of 40000 - 49999 still applies to earlier releases that have upgraded to X8.1.

# Administration: Cisco VCS Control
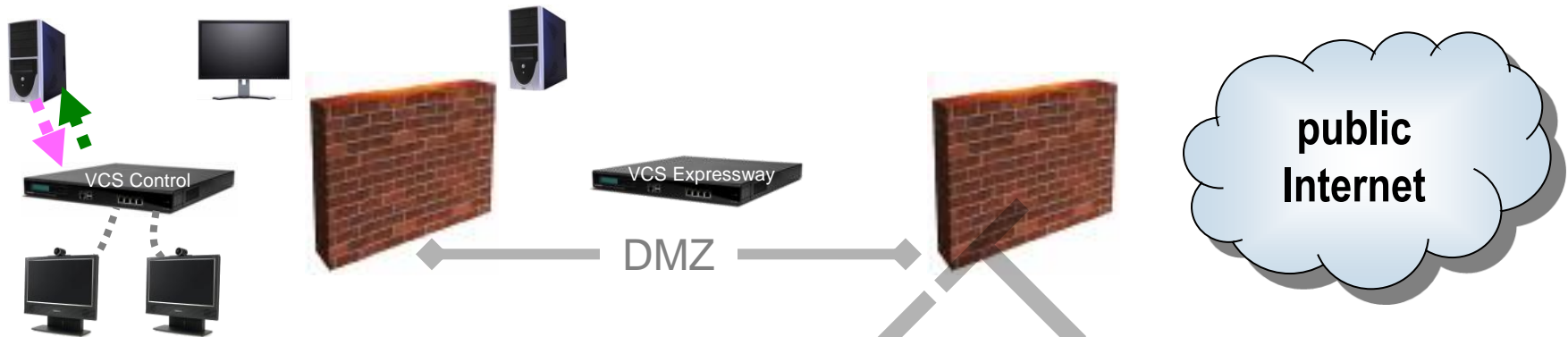


| | Management system source port | VCS Control listening port |
|---|---|---|
| Management control | Private network | |
| Open firewall | n/a | |
| IP address | IP address of management computer(s) | IP address of VCS Control |
| http | TCP **S** >= 1024 | TCP **80** 80 |
| https | TCP **S** >= 1024 | TCP **443** 443 |
| ssh | TCP **S** >= 1024 | TCP **22** 22 |
| SNMP | UDP **S** >= 1024 | UDP **161** 161 |

*(left vertical label: IP Ports)*

**S** = Source port , typically >= 1024

# Administration: Cisco VCS Control



| | Management system listing port ◄▬▬▬▬▬ ▬▬▬▬▬ | VCS Control source port |
|---|---|---|
| Management control | Private network | |
| Open firewall | n/a | |
| IP address | IP address of management computer(s) | IP address of VCS Control |
| **IP Ports** — NTP | UDP **123** *123* | UDP **123** *123* |
| LDAP | TCP **389** *389* | TCP **S** *>= 1024* |
| http (feedback to TMS) | TCP **80** *80* | TCP **S** *>= 1024* |
| DNS | UDP **53** *53* | UDP **S** *>= 1024* |

**S** = Source port , typically >= 1024

# Administration: local endpoint



| | Management system source port | Endpoint listening port |
|---|---|---|
| Management control | Private network | |
| Open firewall | n/a | |
| IP address | IP address of management computer(s) | IP address of Endpoint |
| IP Ports — http | TCP **S** >= 1024 | TCP **80** 80 |
| IP Ports — https | TCP **S** >= 1024 | TCP **443** 443 |
| IP Ports — ssh | TCP **S** >= 1024 | TCP **22** 22 |
| IP Ports — telnet | TCP **S** >= 1024 | TCP **23** 23 |
| IP Ports — SNMP | UDP **S** >= 1024 | UDP **161** 161 |

**S** = Source port , typically >= 1024

# Administration: local endpoint



| | Management system source port | VCS Control source port |
|---|---|---|
| Management control | Private network | |
| Open firewall | n/a | |
| IP address | IP address of management computer(s) | IP address of VCS Control |
| IP Ports — NTP | UDP **123** *123* | UDP **123** *123* |
| IP Ports — http (feedback to TMS) | TCP **80** *80* | TCP **S** *>= 1024* |
| IP Ports — DNS | UDP **53** *53* | UDP **S** *>= 1024* |

**S** = Source port , typically >= 1024

# SIP: internal



| | | VCS Control source port | Endpoint listening port | VCS Control listening port | Endpoint source port |
|---|---|---|---|---|---|
| Call direction | | VCS Control to endpoint | | Endpoint to VCS Control | |
| Open firewall | | n/a | | n/a | |
| IP address | | IP address of VCS Control | IP address of endpoint | IP address of VCS Control | IP address of endpoint |
| IP Ports | SIP signaling | UDP **C** *5060* TCP & TLS **A** *25000 to 29999* | UDP & TCP & TLS **F** *5060 or >= 1024* | UDP: **C** *5060* TCP: **K** *5060* TLS: **L** *5061* | UDP **G** *5060 or >= 1024* TCP & TLS **H** *>= 1024* |
| | RTP | UDP **Y$_C$** *36002 to 59998 ** * | UDP **E** *>= 1024* | UDP **Y$_C$** *36002 to 59998 ** * | UDP **E** *>= 1024* |
| | RTCP | UDP **Y$_C$** *36003 to 59999 ** * | UDP **E** *>= 1024* | UDP **Y$_C$** *36003 to 59999 ** * | UDP **E** *>=1024* |

**C** = Protocols > SIP > UDP port: *default = 5060*

**A** = Protocols > SIP > TCP Outbound port start to end: *default = 25000 to 29999*

**F** = defined by endpoint's registration (or if call is to a non-registered endpoint, IP port is defined by DNS lookup) any port >= *1024*, often 5060 for UDP

**K** = Protocols > SIP > TCP port: *default = 5060*

**L** = Protocols > SIP > TLS port: *default =5061*

**G** = any port >= *1024*, often 5060 for hard endpoints

**H** = any port >= *1024*

**Y$_C$** = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Control): *default = 36000 to 59999 ** *

**E** = Endpoint media port range; value used is specified in the SDP:
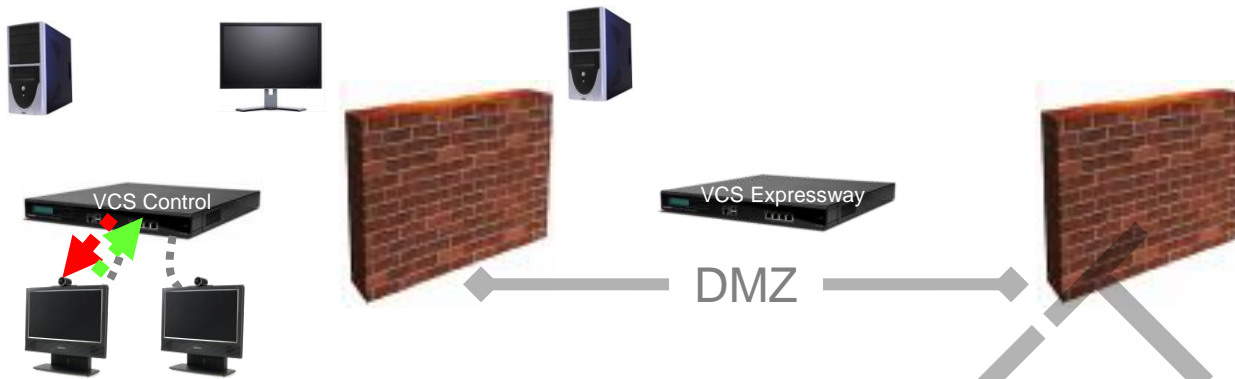= *any IP port above 1024*
= *36000 to 59999 ** * for another VCS
= 2326 to 2385 for MXP static setting
= 11000 to 65000 for MXP dynamic setting

** The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

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# H.323: internal

DMZ

**VCS Control**

**VCS Expressway**

|  |  | VCS Control source port | Endpoint listening port | VCS Control listening port | Endpoint source port |
|---|---|---|---|---|---|
| Call direction |  | VCS Control to endpoint | | Endpoint to VCS Control | |
| Open firewall |  | n/a | | n/a | |
| IP address |  | IP address of VCS Control | Any IP address | IP address of VCS Control | Any IP address |
| IP Ports | Initial RAS connection | - | - | UDP $R_c$ *1719* | UDP **J** *1719* |
| | Q 931 / H.225 signaling | TCP **P** *15000 to 19999* | TCP **G** *1720* | TCP **M** *1720* | TCP **K** *1720* |
| | H.245 | TCP **P** *15000 to 19999* | TCP **H** *>= 1024* | TCP **P** *15000 to 19999* | TCP **H** *>= 1024* |
| | RTP | UDP $Y_c$ *36002 to 59998 \*\** | UDP **E** *>= 1024* | UDP $Y_c$ *36002 to 59998 \*\** | UDP **E** *>= 1024* |
| | RTCP | UDP $Y_c$ *36003 to 59999 \*\** | UDP **E** *>= 1024* | UDP $Y_c$ *36003 to 59999 \*\** | UDP **E** *>=1024* |

$R_c$ = Protocols > H.323 > Gatekeeper Registration > UDP port, *default = 1719*

**J** = Endpoint RAS source port, typically *1719*

**P** = Protocols > H.323 > Gatekeeper > Call signaling port range start to end: *default = 15000 to 19999*

**G** = Endpoint signaling port, specified in registration: any port >= 1024, typically *1720*

**M** = Protocols > H.323 Call signaling TCP port: *default = 1720*

**K** = Endpoint signaling port: any port >= 1024, typically *1720*

**H** = Endpoint H.245 signaling port:
= any IP port >= *1024*
= 15000 to 19999 to another VCS
= 5555 to 5574 for MXP static setting
= 11000 to 65000 for MXP dynamic setting

$Y_c$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Control): *default = 36000 to 59999 \*\**

**E** = Endpoint media port range; value used is specified in codec negotiations:
= *any IP port above 1024*
= *36000 to 59999 \*\** for another VCS
= 2326 to 2385 for MXP static setting
= 11000 to 65000 for MXP dynamic setting

\*\* The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

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# Unified Communications : VCS Control to Unified CM, IM&P



IM&P

Unified CM-UDS

VCS Control

DMZ

VCS Expressway

Internet
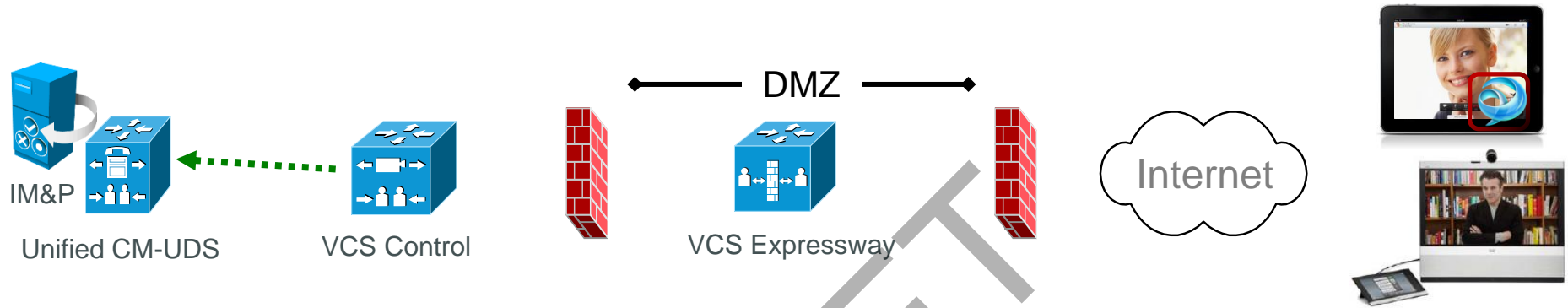
| | Management system listening port ← | VCS Control source port |
|---|---|---|
| Management control | Private network | |
| Open firewall | n/a | |
| IP address | IP address of Unified CM, IM and Presence servers and CUC | IP address of VCS Control |
| IP Ports — XMPP (IM and Presence) | TCP 7400 (IM&P server) | TCP **Ue** 3*0000 to 35999* * |
| IP Ports — UDS (provisioning and phonebook) | TCP 8443 (Unified CM server) | TCP **Ue** 3*0000 to 35999* * |
| IP Ports — HTTP (configuration file retrieval) | TCP 6970 (Unified CM server) | TCP **Ue** 3*0000 to 35999* * |
| IP Ports — CUC (voicemail) | TCP 443 (CUC server) | TCP **Ue** 3*0000 to 35999* * |

**Ue** = VCS TCP ephemeral port range defaults to *30000 – 35999* *

* The default range of 30000 – 35999 applies to new installations of X8.1 or later; the previous default range of 40000 - 49999 still applies to earlier releases that have upgraded to X8.1.

# Unified Communications : Control (private) to Expressway (DMZ)

IM&P

Unified CM-UDS

VCS Control

DMZ

VCS Expressway

Internet
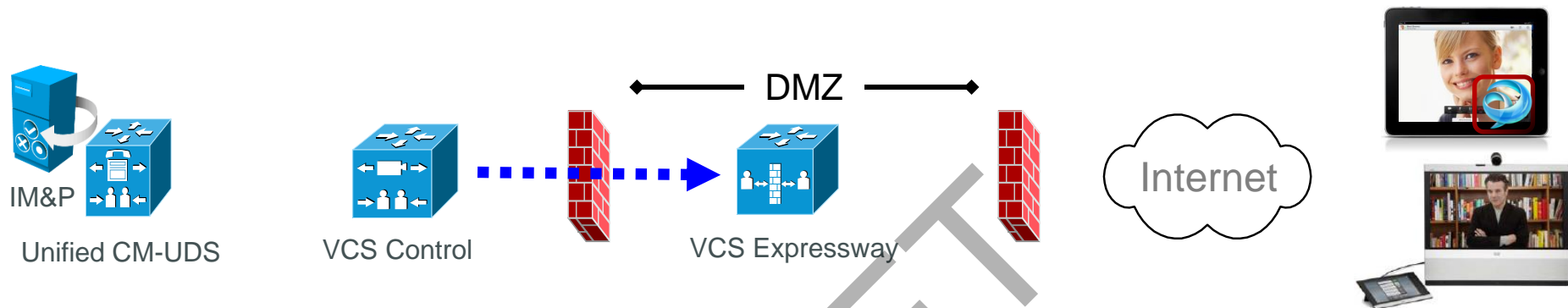
| | VCS Control source port | VCS Expressway server (listening) port |
|---|---|---|
| Message direction | Inbound and outbound calls | |
| Open firewall | Private to DMZ | |
| IP address | IP address of VCS Control | IP address of VCS Expressway |
| IP Ports — XMPP (IM and Presence) | TCP **Ue** 30000 to 35999 * | TCP 7400 |
| IP Ports — SSH (HTTP/S tunnels) | TCP **Ue** 30000 to 35999 * | TCP 2222 |
| IP Ports — SIP signaling | TCP & TLS **A** 25000 to 29999 | TCP and TLS **B** 7001 |
| IP Ports — SIP media | UDP $Y_C$ 36002 to 59999 ** | UDP $Y_E$ 36000 / 36001 *** |
| IP Ports — TURN server control | UDP >= 1024 | UDP 3478 (to 3483) **R** |

**A** = Protocols > SIP > TCP Outbound port start to end: *default = 25000 to 29999*

**B** = Zones > Traversal Client > SIP port, typically *7001* for first traversal zone, *7002* for second etc.

**R** = On Large VCS systems you can configure a range of TURN request listening ports

**Ue** = VCS TCP ephemeral port range defaults to *30000 to 35999 ***

$Y_C$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Control): *default = 36000 to 59999 ****

$Y_E$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway): *default = 36000 to 59999 ** / ****

* The default ephemeral port range of 30000 – 35999 applies to new installations of X8.1 or later; the previous default range of 40000 - 49999 still applies to earlier releases that have upgraded to X8.1.

** The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

*** Systems prior to X8 that are upgraded to X8.2 or later will continue to use the previous media demultiplexing RTP /RTCP ports, typically 2776/2777.

# Unified Communications: Expressway (DMZ) to public internet



| | VCS Expressway source port | Internet endpoint server (listening) port | VCS Expressway server (listening) port | Internet endpoint source port |
|---|---|---|---|---|
| | (outbound →) | | (← inbound) | |
| Message direction | Outbound to an endpoint in the Internet | | Inbound from an endpoint in the Internet | |
| Open firewall | DMZ to Internet | | Internet to DMZ | |
| IP address | Address of VCS Expressway | Any IP address | Address of VCS Expressway | Any IP address |
| XMPP (IM and Presence) | n/a | n/a | TCP *5222* | TCP **S** *>= 1024* |
| UDS (phonebook and provisioning) | n/a | n/a | TCP *8443* | TCP **S** *>= 1024* |
| TURN server control / media | n/a | n/a | UDP *3478 (to 3483)* **R** / *24000 to 29999* * | UDP **S** *>= 1024* |
| SIP signaling | TLS *25000 to 29999* | TLS **S** *>= 1024* | TLS *5061* | TLS **S** *>= 1024* |
| SIP media | UDP **Y**$_E$ *36002 to 59999* ** | UDP **N** *>= 1024* | UDP **Y**$_E$ *36002 to 59999* ** | UDP **N** *>= 1024* |

(IP Ports)

**N** = VCS waits until it receives media, then it sends its media to the IP port from which the media was received (egress port of the media from the far end non SIP-aware firewall): any port *>= 1024*

**R** = On Large VCS systems you can configure a range of TURN request listening ports

**S** = Source port , typically >= 1024

**Y**$_E$ = Local Zone > Traversal Subzone > Traversal Media port start to end (configured on VCS Expressway): *default = 36000 to 59999* **

\* For new installations of X8.1 or later, the default range for TURN relay media ports is 24000 – 29999. The previous default range of 60000 – 61799 still applies to earlier releases that have upgraded to X8.1.

** The default media port range of 36000 to 59999 applies to new installations of X8.1 or later. In Large systems the first 12 ports in the range – 36000 to 36011 – are used for multiplexed traffic only. In Small/Medium systems you can either explicitly specify the 2 ports to use for multiplexed traffic or use the first 2 ports from the media port range. The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later.

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# Unified Communications: Jabber Guest (internet to VCS Expressway)



**Jabber Guest Server**

**Unified CM**

**VCS Control**

**VCS Expressway**

9443  443

9980  80

Internet

Jabber Guest Client
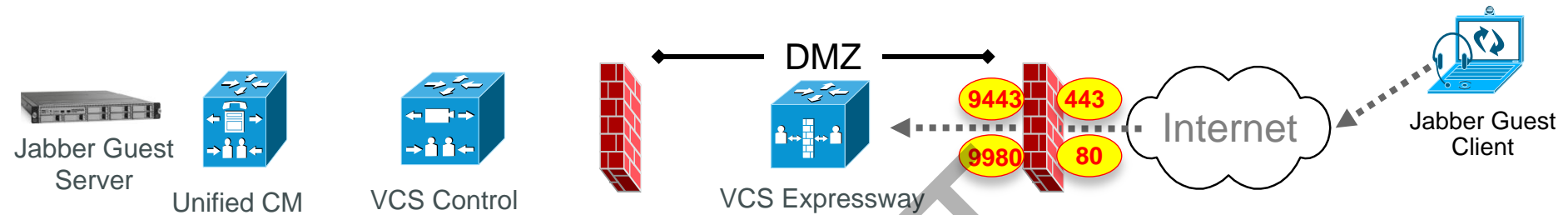
**S** = Source port, typically >=1024

|  | | VCS Expressway Listening Port | Internet SIP UA Source Port |
|---|---|---|---|
| Management Control | | Inbound from SIP UA in the Internet | |
| Open Firewall | | Internet to DMZ | |
| IP Address | | IP address of<br>- VCS Expressway | IP address of<br>- Any (or specific IP) |
| IP Ports | HTTPS traffic | **TCP 9443** | TCP **S**<br>**(to TCP 443)** |
| | HTTP traffic | **TCP 9980** | TCP **S**<br>**(to TCP 80)** |
| | TURN Server Control | UDP 3478 (to 3483) | UDP **S**<br>>= 1024 |

**Must translate the destination port of 443 to 9443 for all HTTPS (and 80 to 9980 for HTTP) traffic that targets the VCS Expressway address from Jabber Guest clients.**

# Unified Communications: Jabber Guest (VCS Control to VCS Expressway)

DMZ

Jabber Guest Server

Unified CM

VCS Control

VCS Expressway

Internet

Jabber Guest Client
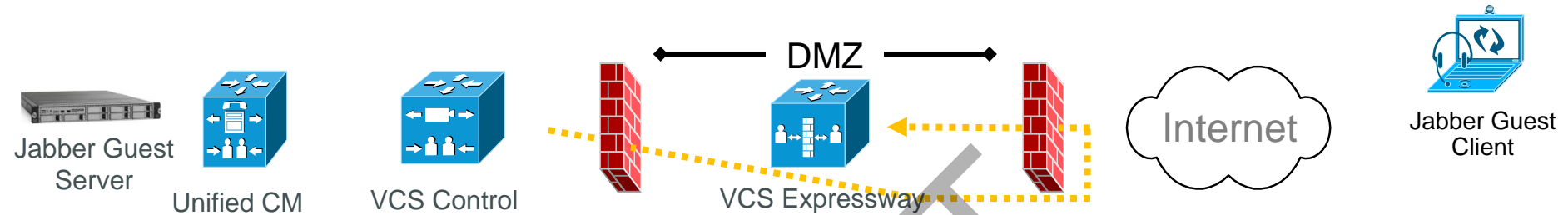
| | | VCS Control Source Port | VCS Expressway Listening Port |
|---|---|---|---|
| Management Control | | Outbound from VCS Control to VCS Expressway | |
| Open Firewall | | Private to Public NAT'd | |
| IP Address | | IP address of - VCS Control | IP address of - VCS Expressway (public) |
| IP Ports | SSH (HTTP/S tunnels) | TCP **E** 30000 to 35999 *1 | SSH 2222 |
| | Traversal Zone SIP signal | TLS **T$_C$** 25000 to 29999 *2 | TLS **T$_E$** |
| | Media | UDP **Y$_C$** 36002 to 59999 *3 | UDP **Y$_E$** 24000 to 29999 *4 |

**E** = Configurable TCP ephemeral port range (on VCS Control)

**T$_C$** = Configurable TCP outbound port range (on VCS Control)

**T$_E$** = Configurable SIP port for Unified Communications traversal zone between VCS Control (on VCS Expressway)

**Yc** = Configurable traversal media ports range (on VCS Control)

**Y$_E$** = Non-Configurable TURN relays media ports range (VCS Expressway)

*1 The default ephemeral port range of 30000 - 35999 applies to new installations of X8.1 or later
The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1
*2 The default outbound port range of 25000 - 29999 applies to new installations of X8.1 or later and earlier releases that have upgraded to X8.1
*3 The default media port range of 36000 - 59999 applies to new installations of X8.1 or later
The previous default range of 50000 - 54999 still applies to earlier releases that have upgraded to X8.1 or later
*4 The default TURN relay media port range of 24000 - 29999 applies to new installations of X8.1 or later
The previous default range of 60000 - 61799 still applies to earlier releases that have upgraded to X8.1

# Unified Communications: Jabber Guest (VCS Expressway to VCS Control)
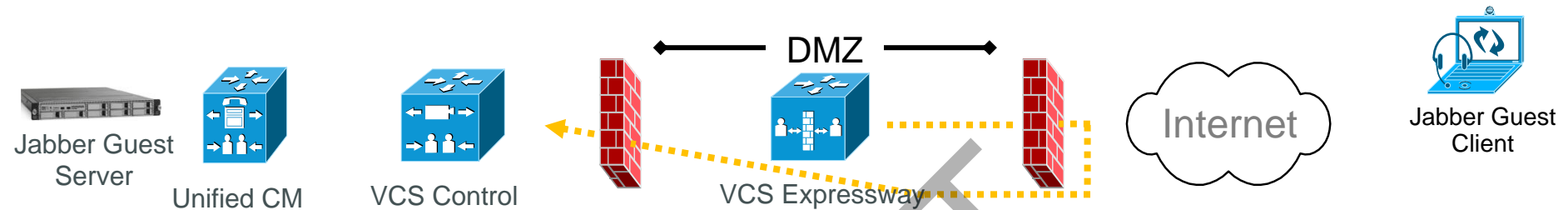


| | VCS Control<br>Listening Port | VCS Expressway<br>Source Port |
|---|---|---|
| Management Control | Inbound from VCS Expressway (public)<br>to VCS Control | |
| Open Firewall | Public NAT'd to Private | |
| IP Address | IP address of<br>- VCS Control | IP address of<br>- VCS Expressway<br>(Public) |
| IP Ports — Media | UDP $Y_C$<br>36000 to 59999 *1 | UDP $Y_E$<br>24000 to 29999 *2 |

$Y_C$ = Configurable traversal media ports range (on VCS Control)

$Y_E$ = Non-Configurable TURN relays media ports range (on VCS Expressway)

*1 The default media port range of 36000 - 59999 applies to new
   installations of X8.1 or later
   The previous default range of 50000 - 54999 still applies to earlier
   releases that have upgraded to X8.1
*2 The default TURN relay media port range of 24000 - 29999 applies
   to new installations of X8.1 or later
   The previous default range of 60000 - 61799 still applies to earlier
   releases that have upgraded to X8.1

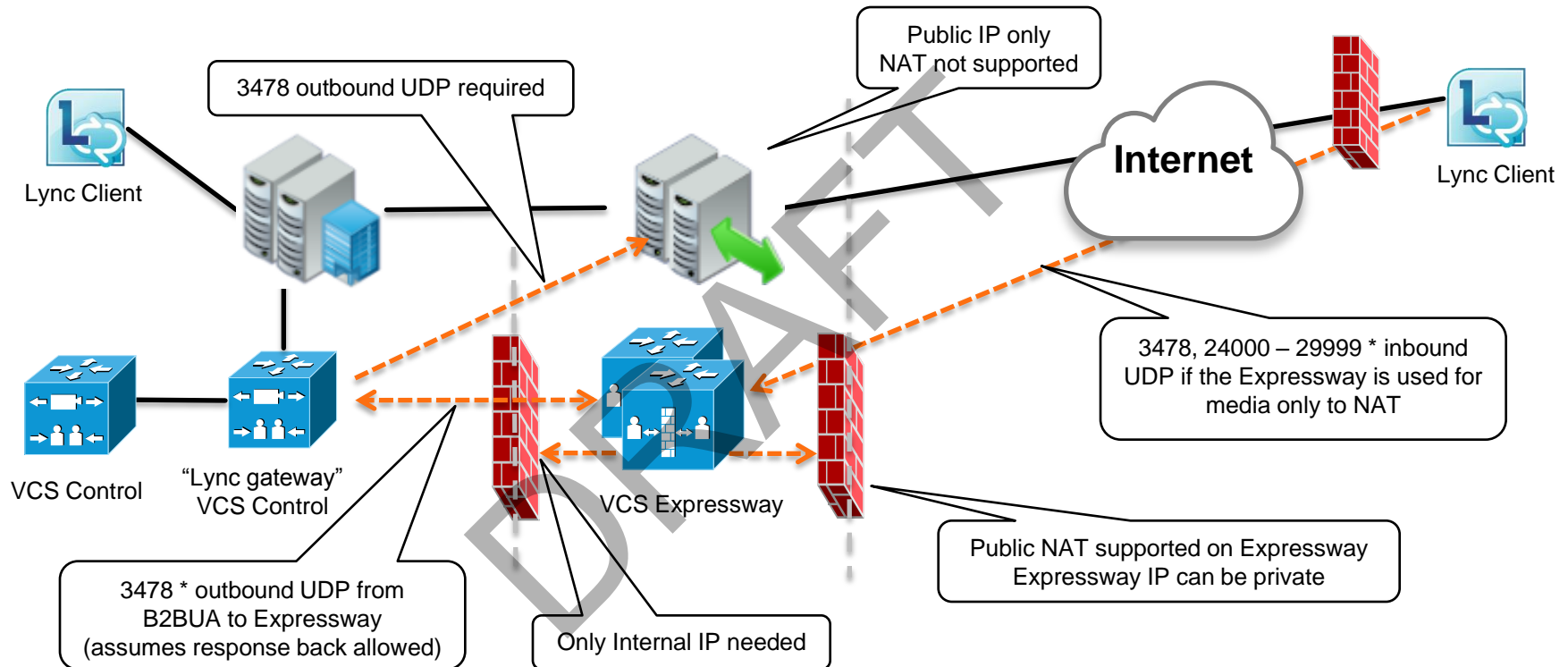# Unified Communications: XMPP federation (VCS Control VCS Expressway / IM&P Server)
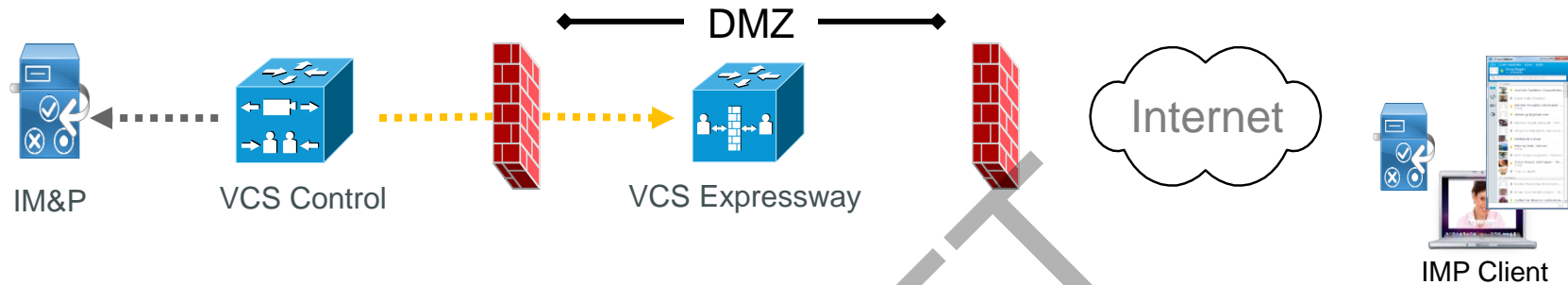


| | | VCS Control Source Port | VCS Expressway Listening Port |
|---|---|---|---|
| XMPP | | Outbound from VCS Control to VCS Expressway (DMZ) | |
| Open Firewall | | Private to DMZ | |
| IP Address | | IP address of - VCS Control | IP address of - VCS Expressway |
| IP Ports | XMPP | TCP **E** (Ephemeral port) | TCP 7400 |

| | | IM&P Server Listening Port | VCS Control Source Port |
|---|---|---|---|
| XMPP | | Outbound from VCS Control to IM&P Server | |
| Open Firewall | | - | |
| IP Address | | IP address of - IM&P Server | IP address of - VCS Control |
| IP Ports | XMPP | TCP 7400 | TCP **E** (Ephemeral port) |

**E**= VCS TCP ephemeral port range defaults to 30000 – 35999 *

\* The default range of 30000 – 35999 applies to new installations of X8.1 or later; the previous default range of 40000 - 49999 still applies to earlier releases that have upgraded to X8.1.

# Unified Communications: XMPP federation (VCS Expressway and Internet)
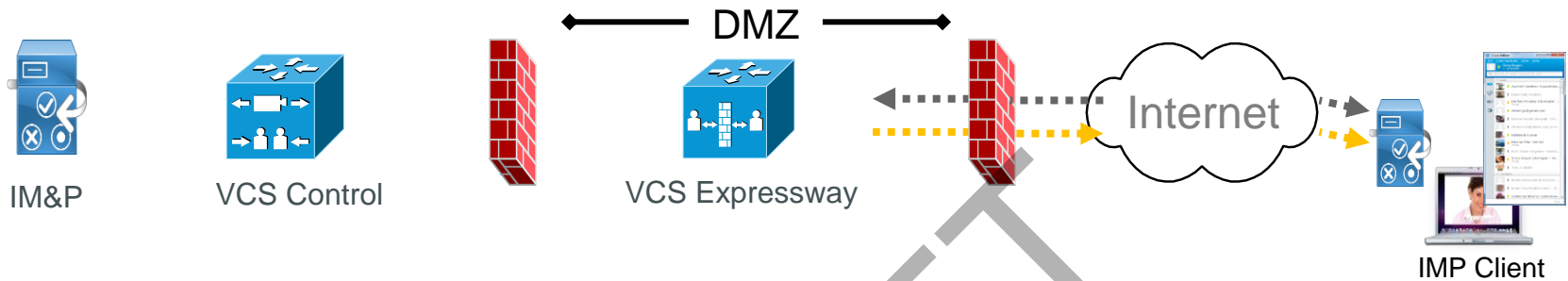


|  |  | **VCS Expressway Listening Port** | **Federated XMPP Server Source Port** |
|---|---|---|---|
| XMPP | | Inbound from public internet to VCS Expressway (DMZ) | |
| Open Firewall | | Internet to DMZ | |
| IP Address | | IP address of<br>- VCS Expressway | IP address of<br>- Federated XMPP Server |
| IP Ports | XMPP | TCP 5269 | TCP<br>Ephemeral port |

|  |  | **VCS Expressway Source Port** | **Federated XMPP Server Listening Port** |
|---|---|---|---|
| XMPP | | Outbound from VCS Expressway (DMZ) to public internet | |
| Open Firewall | | DMZ to Internet | |
| IP Address | | IP address of<br>- VCS Expressway | IP address of<br>- Federated XMPP Server |
| IP Ports | XMPP | TCP **E**<br>(Ephemeral port) | TCP 5269 |

**E**= VCS TCP ephemeral port range defaults to 30000 – 35999 *

* The default range of 30000 – 35999 applies to new installations of X8.1 or later; the previous default range of 40000 - 49999 still applies to earlier releases that have upgraded to X8.1.

# SIP B2BUA and Microsoft Lync



3478 outbound UDP required

Public IP only
NAT not supported

**Internet**

Lync Client

Lync Client

3478, 24000 – 29999 * inbound
UDP if the Expressway is used for
media only to NAT

VCS Control

"Lync gateway"
VCS Control

VCS Expressway

Public NAT supported on Expressway
Expressway IP can be private

3478 * outbound UDP from
B2BUA to Expressway
(assumes response back allowed)

Only Internal IP needed

* On Large  VCS systems you can configure a range of TURN request listening ports (*3478 to 3483*) . For new installations of X8.1 or later, the default range for TURN relay media ports is 24000 – 29999. The previous default range of 60000 – 61799 still applies to earlier releases that have upgraded to X8.1.