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1 – Introduction

Introduction
This document is intended to be a self-study guide to be used to prepare the reader for the subsequent Level 2 Instructor-Led Training (ILT) course. Its primary purpose is to ensure all participants attending the ILT course arrive with the technical knowledge and solution understanding to successfully complete the hands-on training undertaken in Level 2.

It is a required prerequisite with an accompanying qualification examination. Attendance of the ILT will not be permitted without the completion of all prerequisite training and examinations.

Available Resources
In addition to the information contained in this document, please also take a moment to familiarize yourself with the following resources available:

  - VBP System Configuration Guide
- **Infrastructure solution matrix** (registration to the Partner Resource Center required)
  - From the PRC homepage > Sales & Marketing Toolkit > Sales Tools > Product Reference Matrices
  - Select NA (North America) or ROW (Rest of the World)
2 - Overview

Level 1 introduced three distinct learning paths which all converge when discussing telepresence solutions. They are Polycom terminology for features and functions, technical network terminology which is used to detail how those features and functions work, and also the actual solutions themselves.

We will develop each of these three paths further through each training level, but first we will recap the key points covered so far which specifically apply to endpoints and take a look at what is coming up.

Level 1 Recap

Network terminology

- **Port** - doorways or entry gates for specific types of information. For example, all internet browser data arrives at Port 80, and email at Port 25
- **Firewall** – network technology designed to protect a network from threats coming in from the outside. Firewalls often work by using port numbers to allow or deny network traffic
- **Firewall traversal** – network technology to safely pass video traffic through a firewall without introducing security risks
- **Border** – a name commonly used to describe the edge of the internal network where it meets the intern
- **Proxy** - a device, often invisible to the end-user, that directs data from one network to another
- **LAN (Local Area Network)** – multiple devices located in the same area, for example one branch office
- **WAN (Wide Area Network)** – a group of Local Area Networks joined together by a network cloud

Polycom terminology

- **Video Border Proxy (VBP)** – the Polycom firewall traversal solution which operates at the border of two networks to direct data from one network to another. The VBP is also a firewall in its own right

Polycom Security solutions

- **VBP E-Series** – for making calls from inside the network to an outside entity, or to allow an outside entity to make calls into the network
- **VBP ST-Series** – allows people working from home or other locations to connect to the corporate network without connecting to the VPN. It is for situations when integrated access to the network is required for videoconferencing; by registering the endpoint onto the network, it becomes part of the network and can see the directory

Level 2 Overview

We will now begin looking specifically at the VBP family, how it is built and how the entire range fits together in terms of value proposition and positioning.

We will also take a deeper look at some of the features and benefits and introduce some more concepts which are often part of discussions involving security solutions.
3 – Product Range

The title of each solution is made up of the product name, followed by a number which designates the model number. This number is then followed by either an E or an ST to show which functionality the VBP should be used for, and finally another number to show the bandwidth throughput the VBP is capable of managing.

Be aware that not all products are available in all markets, so be sure to check locally on any restrictions.

**VBP 200**

The VBP 200 model is available in two iterations, the VBP 200E and the VBP 200EW. It is designed as a home or small office solution, ideal for remote workers with personal videoconferencing systems. It protects LAN devices from external threats, and supports up to 1mbps in any combination of voice, video, or data. The 200 EW also provides a wireless access point.

**VBP 4555**

The VBP 4555 is also designed as a home or small office solution, supporting up to 3mbps. It is only available in an E-series version, also known as VBP 4555-E3.

**VBP 5300**

The VBP 5300 is designed as an enterprise level solution, and can support up to 25mbps. It is available in E and ST-series options:

- VBP 5300-E10
- VBP 5300-ST10
- VBP 5300-E25
- VBP 5300-ST25

**VBP 6400**

The VBP 6400 is designed for large enterprise and service providers, and can support up to 200mbps. It is also available in E and ST-series options:

- VBP 6400-E85
- VBP 6400-ST85
- VBP 6400-E200
- VBP 6400-ST200
4 – Key Features

Software Keys
As mentioned in Level 1, a software key is used to ‘unlock’ extra features should they be required by the customer. Software keys are available for the following features:

- **E-Series to ST-Series**
  - This can be added to VBP 5300 or VBP 6400 E-series
  - Product codes and pricing are different for different models

- **10Mb to 25Mb upgrade**
  - This can be added to any VBP 5300
  - Product codes and pricing are different for VBP 5300 E-series and VBP 5300 ST-Series

- **85Mb to 200Mb upgrade**
  - This can be added to any VBP 6400
  - Product codes and pricing are different for VBP 6400 E-series and VBP 6400 ST-Series

Embedded Gatekeeper
As any call via an E-Series VBP must follow a dial string which incorporates an E.164 alias, all E-series models incorporate a basic gatekeeper. This is useful in any environment which does not already utilize a gatekeeper, as any endpoint requiring access to and from the outside world can simply be registered to the E-Series.

**H.460**
All the ST-Series models support a method of firewall traversal called H.460. H.460 is an open standard developed to work with H.323, the standard used for videoconferencing across IP networks. Simply put, H.460 creates a tunnel for the video traffic which then passes through any firewall between the far end endpoint and the VBP.

Access Proxy
Access proxy enables end-users using CMA Desktop or HDX endpoints to register their devices to the external IP address of the ST-Series VBP. The VBP then proxies all registration, authentication, presence and management information to the CMA on the inside of the network to join the CMA Desktop or HDX endpoint as though they were on the LAN.
5 - Architecture

VBP Chassis

All the models which encompass the VBP range are built using Linux, which is very secure and not susceptible to network threats or attacks.

Each model has a different chassis and form factor, and runs its own version of software, though for ease of use each model looks the same when configuring via the browser UI.

Operational Overview

At a very basic level, the VBP needs three things. It needs:

- An internal IP address, which connects the VBP to the LAN (also called the provider side – this side provides services to the outside)
- An external IP address, which connects the VBP to the outside of the network (also called the subscriber side – this side is where the subscribers are located)
- A gatekeeper – this can be the embedded gatekeeper (on an E-series) or a CMA or similar on the inside of the network

To understand how the VBP works we need to take a look at how it is used from an end-user perspective for both E and ST-Series.

- E-Series
  - Participant A is outside the network
  - The external IP address of the VBP is 10.11.12.13
  - Participant B is inside the network on an endpoint registered to the CMA with an E.164 alias of 1000
  - Participant A dials either of the following:
    - 10.11.12.13##1000
    - 1000@10.11.12.13
  - The VBP receives the call setup messages, removes the # or @ separator, and forwards the E.164 alias to the CMA, which is listed as the LAN-side gatekeeper
  - The CMA sends the call setup messages to the endpoint in participant B’s office, and call setup completes

- ST-Series
  - Participant A is outside the network in a home office
  - Participant A’s endpoint has the gatekeeper details set to register to the external IP address of the VBP
  - Participant B is inside the network on an endpoint registered to the CMA with an E.164 alias of 1000
  - Participant A dials 1000
  - The VBP receives the call setup messages and forwards the E.164 alias to the CMA, which is listed as the provider-side gatekeeper
  - The CMA sends the call setup messages to the endpoint in participant B’s office, and call setup completes

It is also worth mentioning at this point that it is not just endpoints which can register to an ST-Series VBP. It is also possible to create a ‘video WAN’ by registering an E-Series VBP to an ST-Series VBP.
This would work where a small branch office using the E-Series VBP would have the E-Series set to WAN-side gatekeeper mode, pointing to the ST-Series at the head office. All the branch office endpoints register to the E-Series, which sends all the information to the ST-Series. All the endpoints are registered to the head office gatekeeper and can all dial each other using the E.164 aliases.

To help illustrate the differences between the two models, here are two simplified diagrams. The first shows how an E-Series could be used for a head office and branch office environment.

- 1001 and 1002 register directly to the GK
- 2001 and 2002 register to the VBP 4350. The E2S and the E3 cannot share a dial plan in this configuration
- The units on the internet cannot register to the GK on the LAN, but can connect via the E2S to 1001 and 1002
- The units on the internet cannot register to the GK on the LAN, but can connect via the E3 to 2001 and 2002

The second shows how an ST-Series can be used to create a video WAN

- 1001 and 1002 register directly to the GK
- 1003 and 1004 register to the same GK via the E-Series connection to the ST-Series, which proxies registration to the GK so the dial plan is shared across the network
- The unit behind the firewall registers directly to the ST2S, which proxies registration to the GK
- The only unit which cannot connect is the unit which is not registered into the solution
- By placing an E-Series at HQ in addition to the ST-Series, both VBP sites will have the ability to call or be called by anyone on the Internet while still taking part in the HQ site’s dial plan
Where an existing firewall is in place, the VBP sits in the DMZ (literally De-Militarized Zone – a term for an area which is neither inside or outside the network. It is configured as a feature of the firewall, and devices in the DMZ are not under the control of the normal firewall rules). From there, the firewall is configured to allow any traffic to the IP address of the VBP on the relevant ports. This configuration means that the firewall is aware of all traffic heading to and from the VBP.

An alternative method for implementation requires only one firewall port open, but requires more infrastructure. It is also possible to put a VBP on the inside of the network and put another VBP on the outside of the network. All the traffic can then use one single port as the two VBPs create a tunnel for all the traffic. There are several ways this can be done, but here is a simple diagram of the basic concept:
6 – Conclusion

This guide has provided a further foundation to the fundamentals covered in the Level 1 Infrastructure Overview Course.

It will be of assistance when working through the Level 2 Development courses and ILT.