APC Power Architecture for Cisco Catalyst Switches Powering IP Phones

When Cisco customers deploy Catalyst 4006, 6509 and 6513 switches to handle both voice and data traffic, it is essential to provide clean, available power to the networking infrastructure. This paper provides reference architecture for using APC's Symmetra RM UPS to power these switches.

APC Symmetra is a proven N+1 redundant, uninterruptible power supply that provides a high level of power availability for converged networks and other mission critical applications. Modular components make Symmetra easy to service. Integrated software provides a high level of manageability through advanced diagnostics and reporting. Symmetra's scalability offers the possibility of a UPS investment that matches the level of phone deployment.

Please be aware of the following qualification statement and if the assumptions don't hold, contact APC for a more appropriate solution.

Qualification

This architecture assumes the customer is:

1. Utilizing Cisco's in-line power port technology to power IP phones
2. Deploying the Cisco Switch with redundant power supplies and would want a redundant power solution to match.
3. Planning to fully utilize the phone capacity of the Cisco switch.
4. Customer is deploying the equipment in a 208/120V 60hz environment (like the United States).

Organization

The rest of this paper is organized into sections for each Catalyst switch with the corresponding correct Symmetra solution. The section includes a recommended UPS as well as the recommended power cords for the power supplies within the switch itself.

Cisco Catalyst 4006 Switch

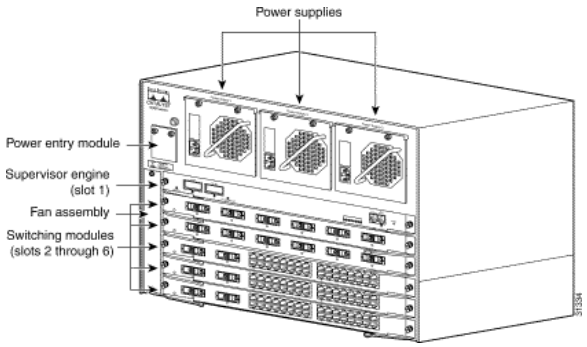


Fig 1. 4006 Switch

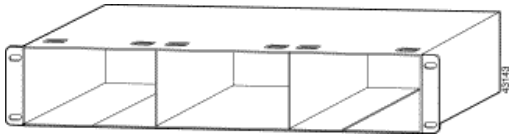


Fig 2. External Power Shelf

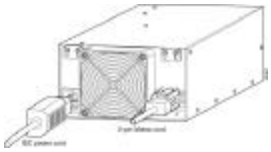


Fig 3. External Power Supply

Powering IP phones from the Catalyst 4006 Switch requires the addition of an external power shelf (Fig 2) and power modules (Fig 3.). The total power draw for a totally utilized switch is just above 3000 Watts.

Recommended UPS: SYH6KNRMT-P1 (figure 4, 5, and 6 below)

This is a 4.2 KW Symmetra RM UPS with an N+1 Redundant architecture that will provide ten minutes of runtime at full load. This product requires an L6-30R for input and ships standard with two L6-20R, one L6-30R, and a step down transformer (SYTF2) with twelve 5-20 outlets. The transformer plugs directly into the output L6-30R. The customer should order the 4006 switch with NEMA 5-15P plugs for each power supply.

Fig. 4 SYH6KNRMT-P1 front view

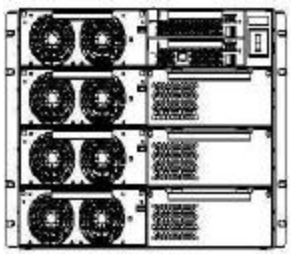


Fig. 5 SYH6KNRMT-P1 rear view

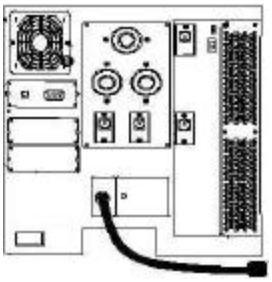
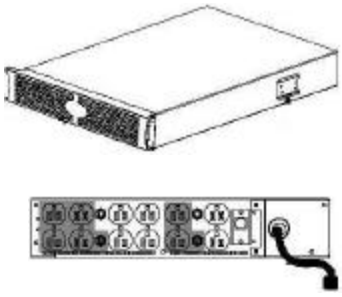


Fig. 6 SYTF2 front and rear



Cisco Catalyst 6509 Switch

The Catalyst 6509 Switch offers different power supply options (1000W, 1300W, 2500W or 4000W) depending on the number of phones to be powered. A redundant solution with 4000W power supplies would draw a maximum of 4100 Watts.

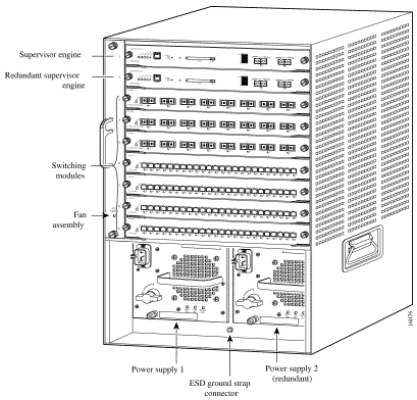


Fig 7. 6509 Switch

Recommended UPS: SYH6KNRMT (see fig 4 and 5 above)

This is a 4.2 KW Symmetra RM UPS with an N+1 Redundant architecture that will provide ten minutes of runtime at full load. This product requires a NEMA L6-30R for input and ships with standard output of two L6-20R and one L6-30R. The customer should order the 6509 switch with NEMA L6-20P plugs for each power supply.

Cisco Catalyst 6513 Switch

The Catalyst 6513 Switch provides the –48 VDC required to power the desktop IP phones directly from the switch itself. Catalyst 6509 Switch offers different power supply options (1000W, 1300W, 2500W or 4000W) depending on the number of phones to be powered. A redundant configuration is recommended.

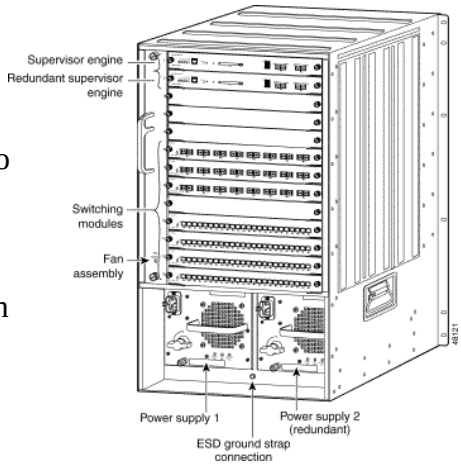


Fig 8. 6513 Switch

Recommended UPS: SYP12K12RMT (Figures 9 and 10)

This is an 8.4 KW Symmetra RM UPS with an N+1 Redundant architecture that will provide ten minutes of runtime at full load. This product requires a hardwired input and standard output is six L6-20R and three L6-30R. The customer should order the 6509 switch with NEMA L6-20P plugs for each power supply.

Fig. 9 SYP12K12RMT Front View

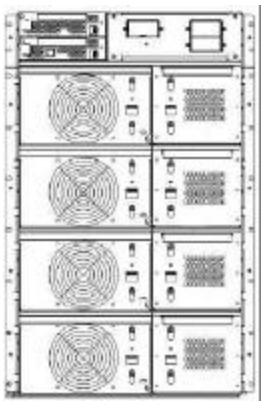
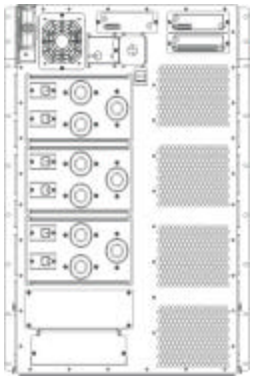


Fig. 10 SYP12K12RMT Rear View



Further Considerations

Extended runtimes

Symmetra Extended Run Frames (SYRMXR4B4) can be added to the Symmetra RM UPS for up to 4 hours of runtime. These frames are 4U high and are easily added via a hot-installable connector. Up to seven of these Extended Run Frames can be added to any Symmetra RM UPS. Each SYRMXR4B4 will provide an additional 30 minutes of runtime for the configurations described above.

Multiple switches

Many customer configurations will involve multiple switches in the same equipment room. There are different methods of providing protection for this scenario including one UPS per switch or one UPS for the entire room. To size one UPS for multiple switches, add up the total watt rating and APC's web-based sizing guide can specify the correct UPS configuration.

Other configurations

Symmetra RM UPS is only one possible choice for providing power protection. Symmetra's scalable N+1 redundant design and user-serviceability make it a good first choice for Catalyst Switches. Certain customers may require different features from their UPS. Some customers for example may insist on separate UPS and separate power feeds for each Catalyst power supply. Others may not require any redundancy and just want the most basic UPS that will support the load for five minutes.

HVAC

IP Telephony switches utilizing inline power port technology require much more power than usually required in an equipment room for data switches. A direct result of this is a much higher heat loss. This generates a need for good environmental control and ventilation.

Racks

Many of these switches will be replacing current data routers and other networking equipment. These current devices are typically found in two post racks with small weight bearing capacity. The Symmetra UPS with extended runtime combined with a couple Catalyst Switches would far exceed the typical weight capacity of these racks. This plus the heat considerations make a two thousand pound rated four-post open rack a consideration to replace the older racks.

If the customer insists on retaining the two-post racks, APC can provide this customer with two-post mounting kits or floor mounting kits with casters for the Symmetra RM UPS Family.

Other voltage areas

Customers deploying Cisco equipment in areas with other voltage requirements (i.e. 230V, 50 Hz) will need different Symmetra skus. The following table serves as a direct replacement for the Symmetra RM UPS part numbers described in the document above.

Cisco Switch	208/120V 60 Hz	230V 50 Hz	200/100V 60 Hz
4006	SYH6KNRMT-P1	SYH6KNRMI	SYH6KNRMJ-P1
6509	SYH6KNRMT	SYH6KNRMI	SYH6KNRMJ
6513	SY12K12RMT	SY12K12RMI	SY12K12RMJ
all	SYRMXR4B4	SYRMXR4B4I	SYRMXR4B4J
4006	SYTF2	N/A	SYTF2J