



System Overview

This chapter, which provides an overview of the Cisco Digital Building Cree Solution implementation, includes the following major topics:

- [System Topology, page 2-1](#)
- [System Components, page 2-3](#)
- [System Networking, page 2-4](#)

System Topology

The Cisco Digital Building Cree Solution can be deployed in multiple deployment topologies, based on the customer's requirements and the time when the installation will be done.

Refer to the *Cisco Digital Building Cree Design Guide* for more details on different deployment topologies.

[Figure 2-1](#) and [Figure 2-2](#) show physical network topologies for a large scale lighting network integration with a Campus Network, where wiring closet access switches (Cisco Catalyst 3850 stack or Cisco Catalyst 4506-E) connect to a Campus Network aggregation/distribution switch (Cisco Catalyst 4500-X). In this deployment, the aggregation switch aggregates lighting wiring closet switches and provides IP addressing to light fixtures using DHCP. An aggregation switch in a Campus Network collapsed core/distribution layer connects to the data center via a firewall. The firewall allows only management traffic from the lighting network to flow to the data center.

[Figure 2-1](#) and [Figure 2-2](#) show the Cisco Catalyst 3850 switch as an example data center switch for the server farm network access. However, any data center switch as recommended or implemented in the campus data center design, can be leveraged to configure network access to servers.

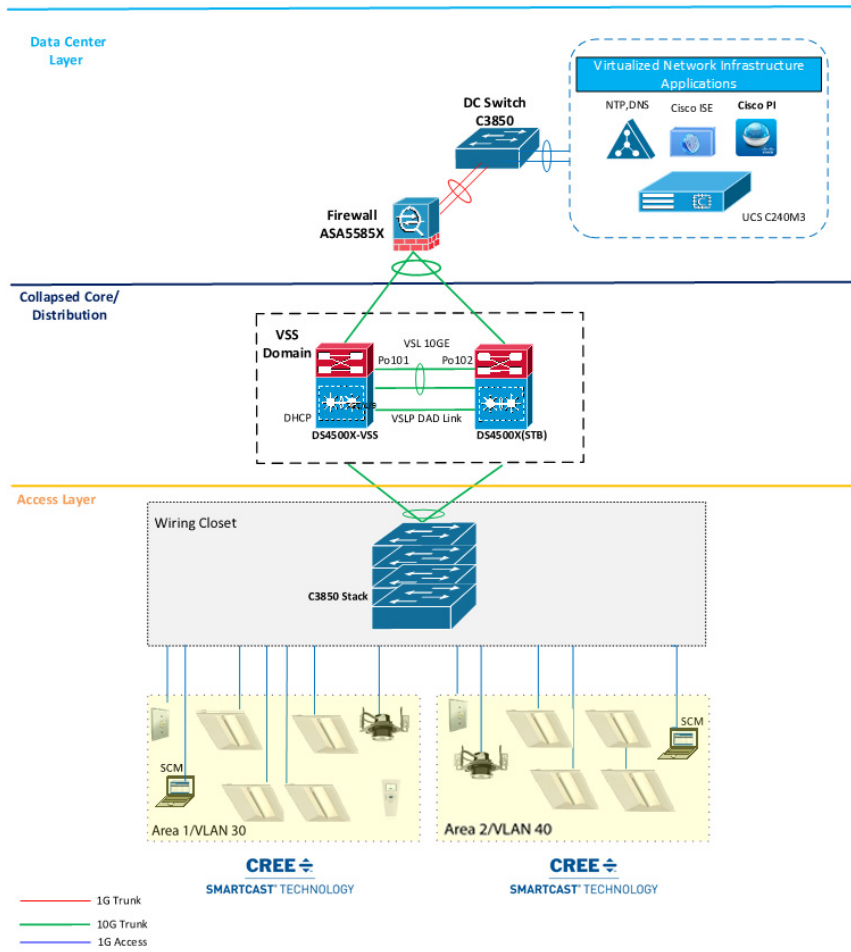


Note

The Campus Network topology shown in [Figure 2-1](#) is one of the deployment models of Campus Network architectures (that is, using a Collapsed Core Network topology) considered for the system design and validation. The detailed implementation of a Campus Network for enterprise network services is beyond the scope of this document. For detailed implementation and best practices for deploying the Campus Network, refer to the *Cisco Campus Network CVD* at the following URL:

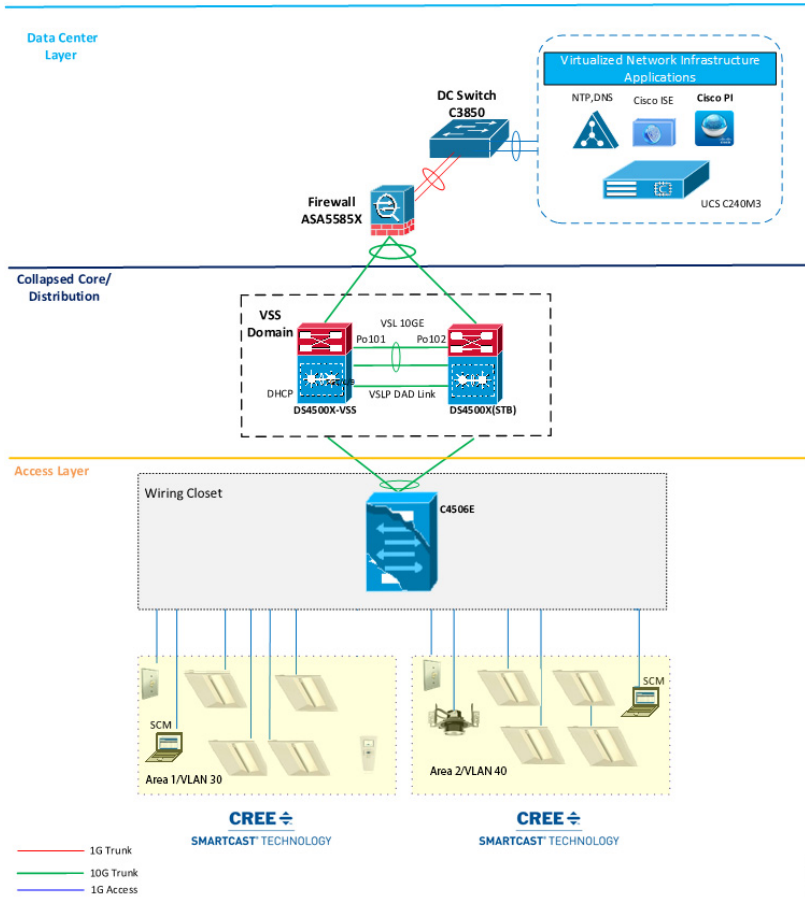
- <http://www.cisco.com/c/dam/en/us/td/docs/solutions/CVD/Aug2014/CVD-CampusWiredLANDesignGuide-AUG14.pdf>

Figure 2-1 Cisco Digital Building Cree Solution on a Campus Network—Physical Topology with Cisco Catalyst 3850 Stack in Wiring Closet



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Figure 2-2 Cisco Digital Building Cree Solution on a Campus Network—Physical Topology with Cisco Catalyst 4506E in Wiring Closet



System Components

The components validated within this system consist of a mix of Cisco products (see [Table 2-1](#)) and Cree products (see [Table 2-2](#)).

Table 2-1 Cisco Components

Cisco Product	Software Release	Description
Cisco Catalyst 3850 Switch—Wiring Closet/Access Switch	3.7.0 EX	UPOE switch
Cisco Catalyst 4506-E Switch—Wiring Closet/Access Switch	15.2(3)E1	Wiring closet access switch with UPOE line cards
Cisco Catalyst 4500-X Switch—Core/Distribution Switch	03.07.01_15.2(3)E1	Campus network aggregation switch
Cisco Prime Infrastructure	3.0	Network Management and Syslog server

Table 2-1 Cisco Components (continued)

Cisco Product	Software Release	Description
Cisco Identity Server Engine (ISE)	2.0	TACACS+ authentication and authorization server for network devices
Cisco ASA 5585 Firewall	9.6.1	Firewall to protect server farm

Cree will provide the list of commercial names for the following products so that it is in line with the website and the ordering process. See [Table 2-2](#).

Table 2-2 Cree Components

Vendor Product	Release	Description
Cree CR22,CR24 UPOE Troffers	1.2.2	Light fixture
Cree KR6	1.2.2	6" down light
Cree PoE Wall Dimmer	1.2.2	Wall control switch
Cree Configuration Tool	1.2.2	Wireless configuration tool for fixture selection
Cree SmartCast Manager	1.2.2	Light commissioning application

[Table 2-3](#) is the list of third-party infrastructure components used in the system.

Table 2-3 Third-Party Components

Product	Purpose	Version
Virtualization Software for UCS	Hypervisor	VMware ESXi 5.5
SmartCast Manager OS Platform	Operating System	Microsoft Windows 7 Enterprise Release SP1

System Networking

The Digital Building system should deploy on a separate logical network (VLAN) with a limit of 1,000 lights fixtures per VLAN. A new VLAN is required to deploy more than 1,000 light fixtures, which will restrict the number of broadcast messages the light fixtures can process at a time. Each VLAN requires a SmartCast Manager to configure, calibrate and monitor the light fixtures.

This section summarizes the logical network (VLAN) configuration for the Cisco Digital Building Cree Solution network. In [Table 2-4](#), which lists example implemented VLANs, the subnet mask 255.255.252.0 is used to allow up to 1000 light fixtures per VLAN, as recommended in the *Cisco Digital Building Cree Design Guide*, Section 4.2.

Table 2-4 Example List of VLANs

VLAN	Purpose	Network/Mask
30	VLAN for light fixtures and SmartCast Manager in the data network	10.30.0.0/22
40	VLAN for light fixtures and SmartCast Manager in the data network	10.40.0.0/22
50	Management VLAN for the network management traffic	10.50.0.0/22
70	Data VLAN in data center for applications	10.70.0.0/22

**Note**

The VLANs shown in [Table 2-4](#) are only examples that were used in this Cisco Digital Building Cree Solution validation. VLAN numbering may vary based on your actual deployment.
