SOLTECH
Solution of optical & Network

Network Solution Project Casebook

SOLTECH NETWORK SOLUTION PROJECT

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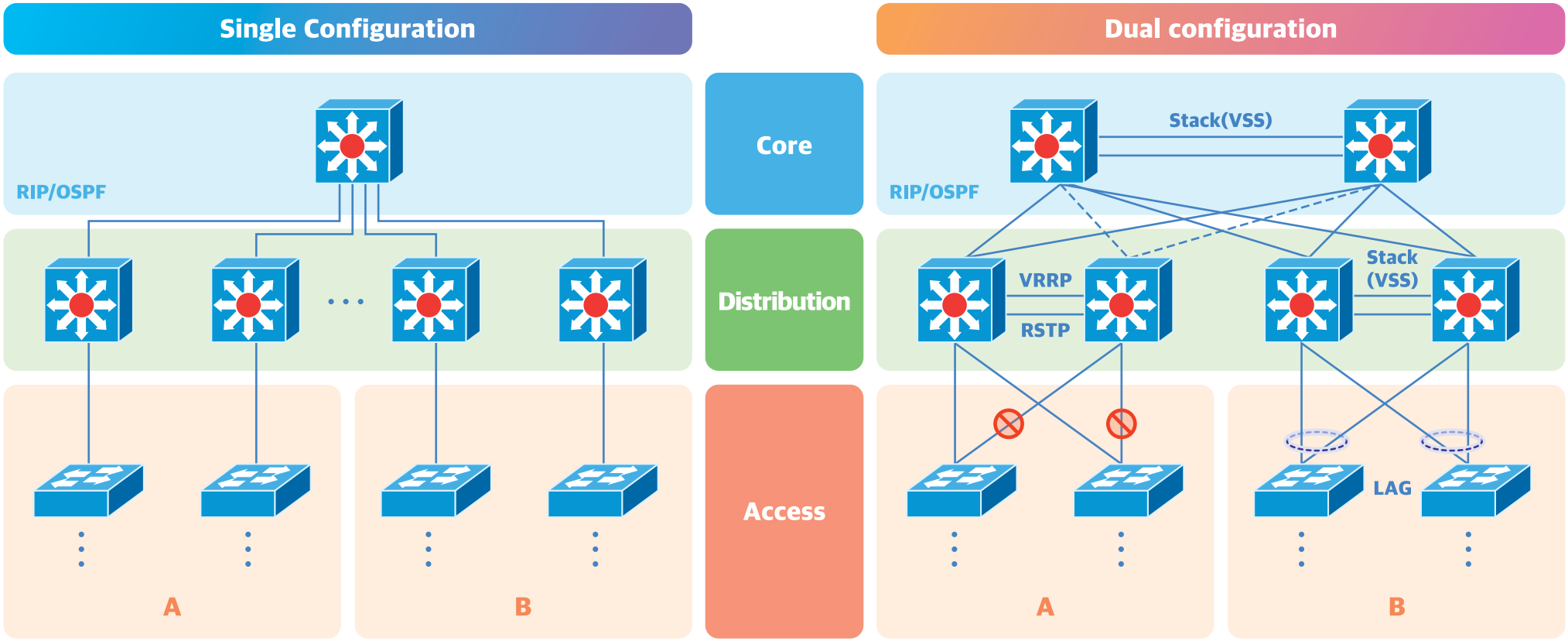
Network Basic Configuration - 3 layers of Large Network

❶ Single Configuration: The basic three-layer configuration of Core-Distribution-Access, where Core/Distribution layers are set up with L3 and the Access layer with L2 configuration. It offers the advantage of lower system setup costs, but lacks duplexing measures in case of failures.

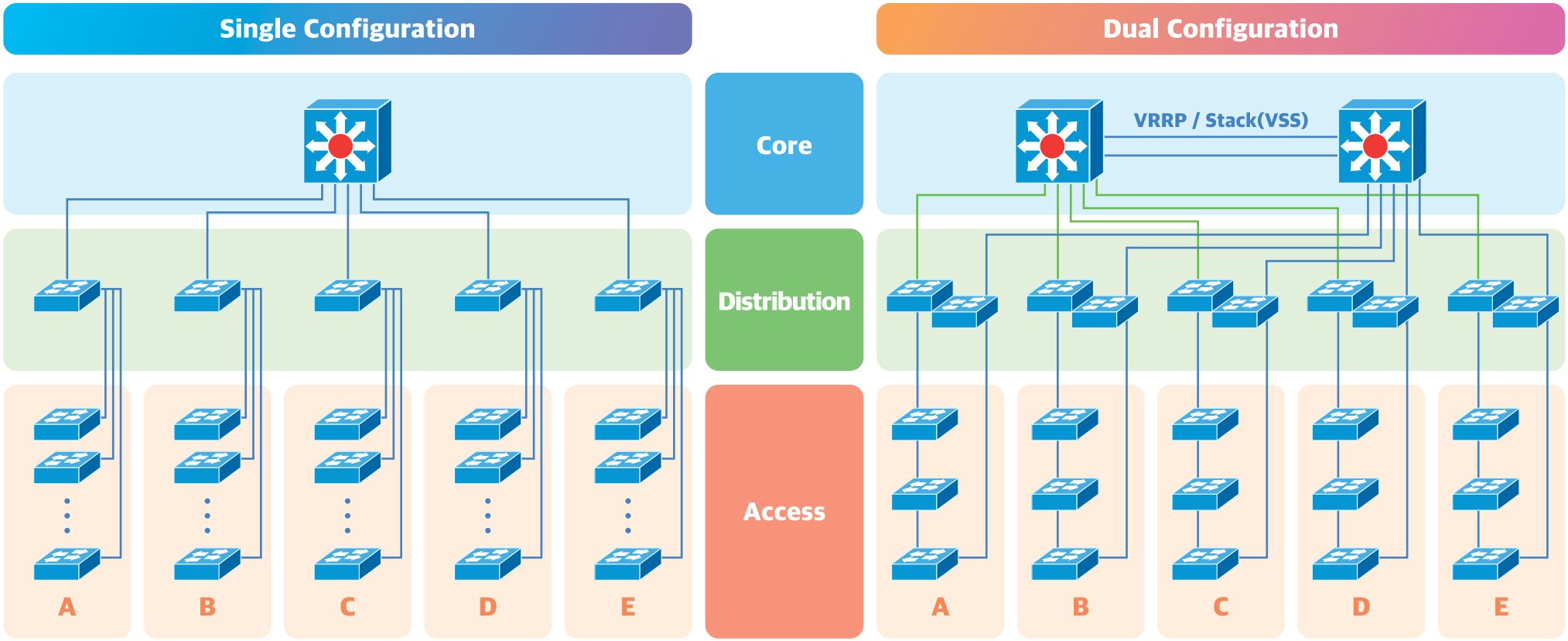
❷ Dual configuration: Dual three-layer configuration of Core-Distribution-Access, where Core/Distribution layers are set up with L3 and the Access layer with L2 configuration. It provides the advantage of redundancy in case of failures, but comes with higher system setup costs.



Network Basic Configuration - 3 layers of Medium Network

❶ Single Configuration : The basic three-layer configuration of Core-Distribution-Access for a medium-sized network, where the Core is set up with L3 and the Distribution/Access layers are configured with L2. It offers the advantage of lower system setup costs but lacks duplexing measures in case of failures.

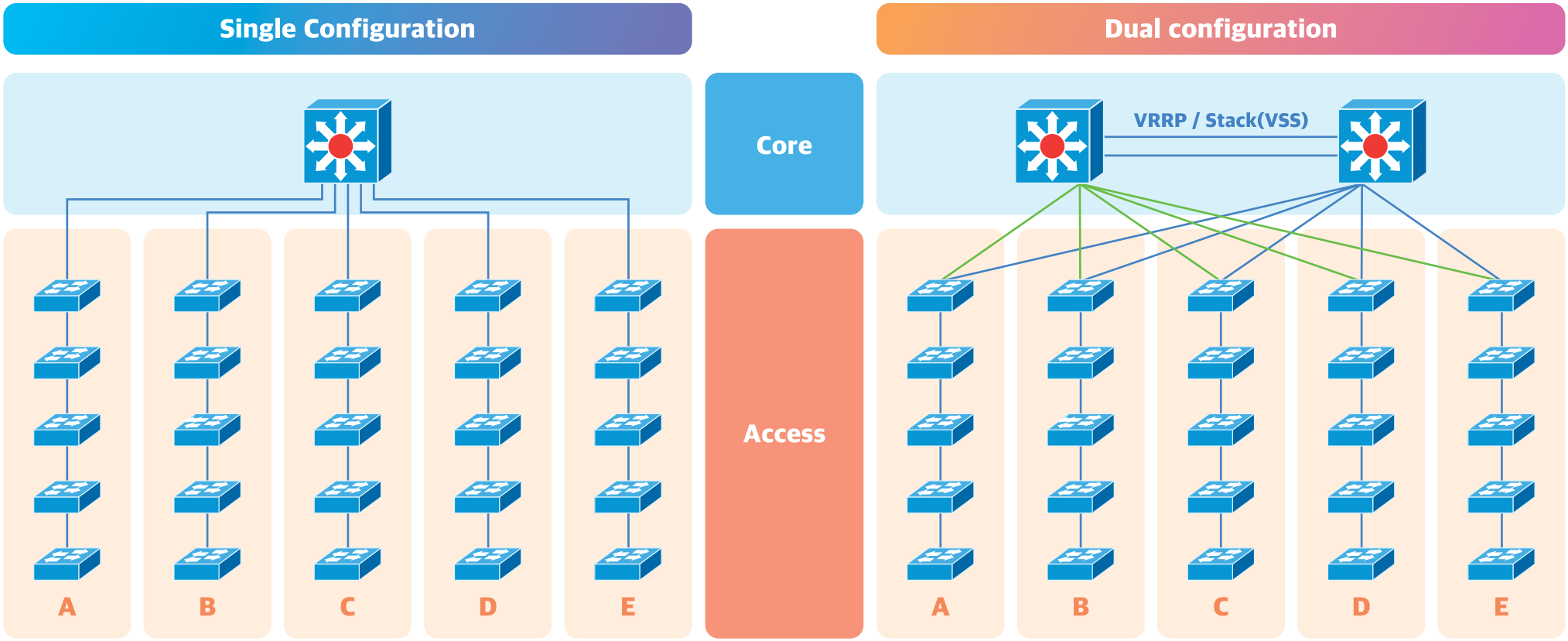
❷ Dual configuration : Dual three-layer configuration of Core-Distribution-Access for a medium-sized network, where the Core is set up with L3 and the Distribution/Access layers are configured with L2. This redundant configuration provides the advantage of redundancy in case of failures, but comes with higher system setup costs.



Network Basic Configuration - 2 layers of Medium Network

❶ Single Configuration : The configuration of an integrated core-access layer without a separate distribution layer, for small to medium-sized networks. The advantage is its low construction cost, but the disadvantage is the lack of redundancy measures in case of failure.

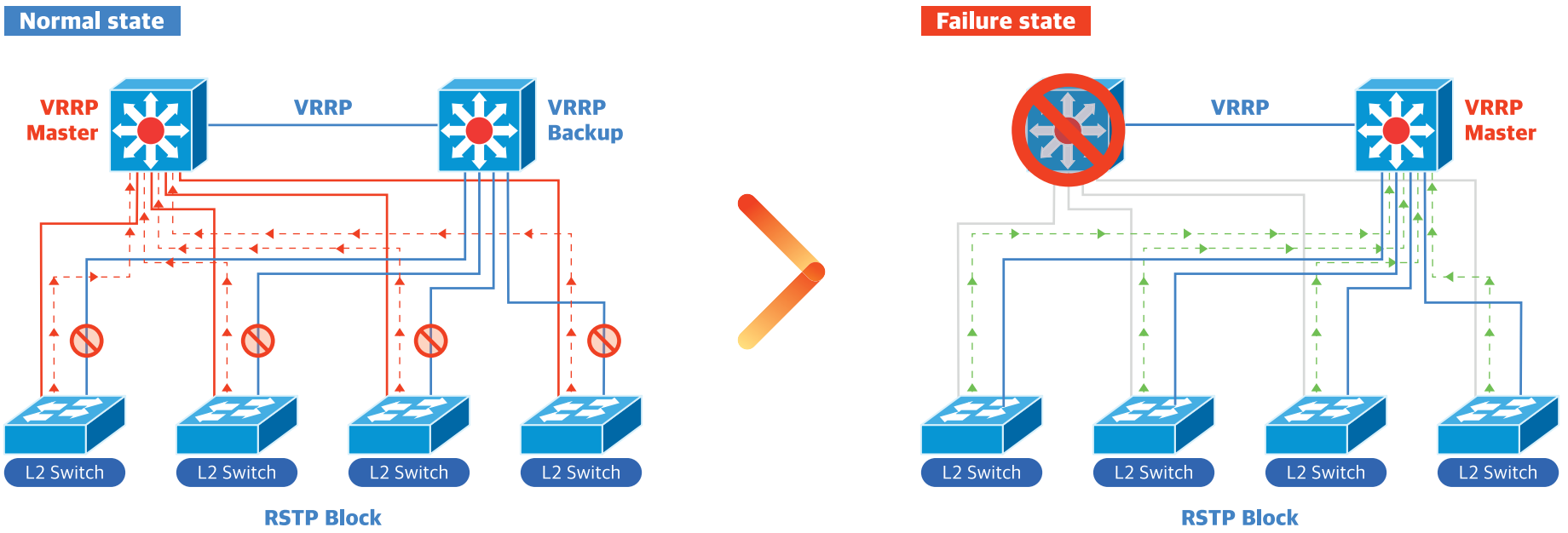
❷ Dual configuration : The configuration of an integrated core-access layer without a separate distribution layer, for small to medium-sized networks. The advantage is the redundancy of the integrated core, ensuring stability even in case of failure, but the disadvantage is a slightly higher construction cost.



L3&L2 Switch Redundant Configuration - The introduction of L3 Switch provides functional stability and scalability effects

- Multiple IP subnets can be configured, providing Layer 3 IP forwarding among subnets.
- VLANs logically separate LANs, improving security, reducing costs, minimizing unnecessary traffic, and facilitating network management.
- Spanning Tree is used to implement loop prevention and physical link redundancy.
- Gateway redundancy is achived by using VRRP protocol.
- Dynamic routing protocols (such as RIP, OSPF, BGP) are utilized for setting up IP routes and exchanging data with upper-level devices.
- Network design consulting, construction technical support, and failure handling technical support are available.
  (on-site support/remote support/phone support after consultation)

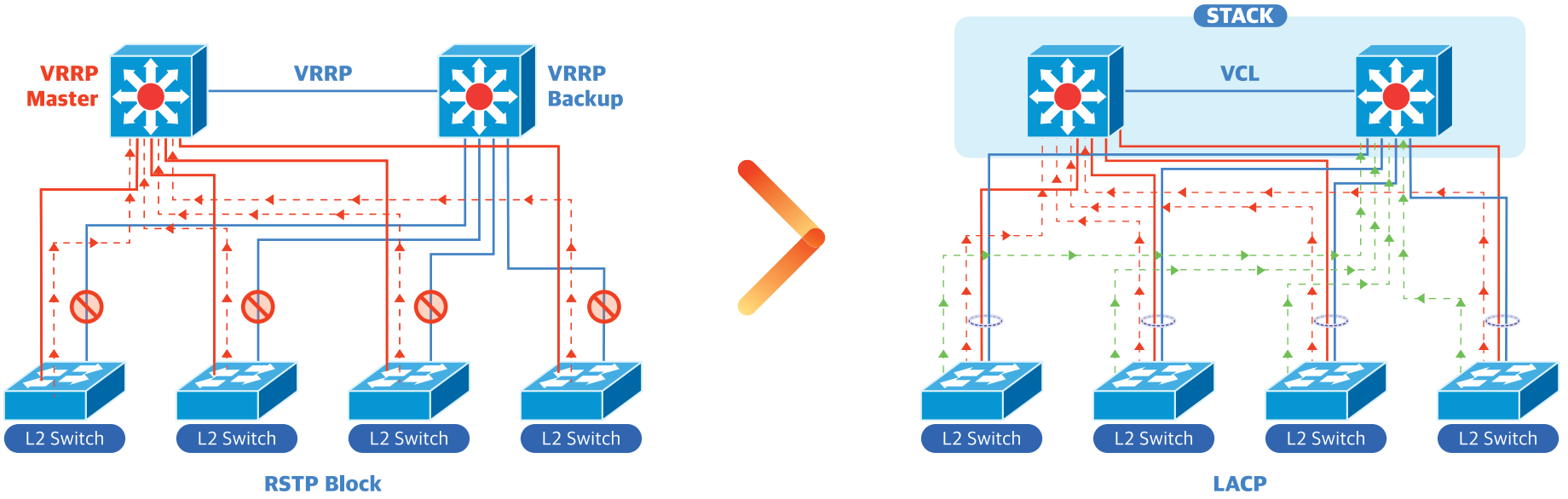
Redundant design using VRRP and RSTP



Stacking (Virtual Switching System) - Benefits of high-performance redundant configuration with no idle equipment/links.

- It allows multiple separate switches to function logically as one.
- Spanning-tree usage is unnecessary, enabling efficient utilization of network resources. (switches/links)
- LACP can be used between standalone switches and stacks to increase network bandwidth.
- Stack configuration is possible within the same manufacturer and product group.
- Network design consulting, construction technical support, and failure handling technical support are available.
  (on-site support/remote support/phone support after consultation)

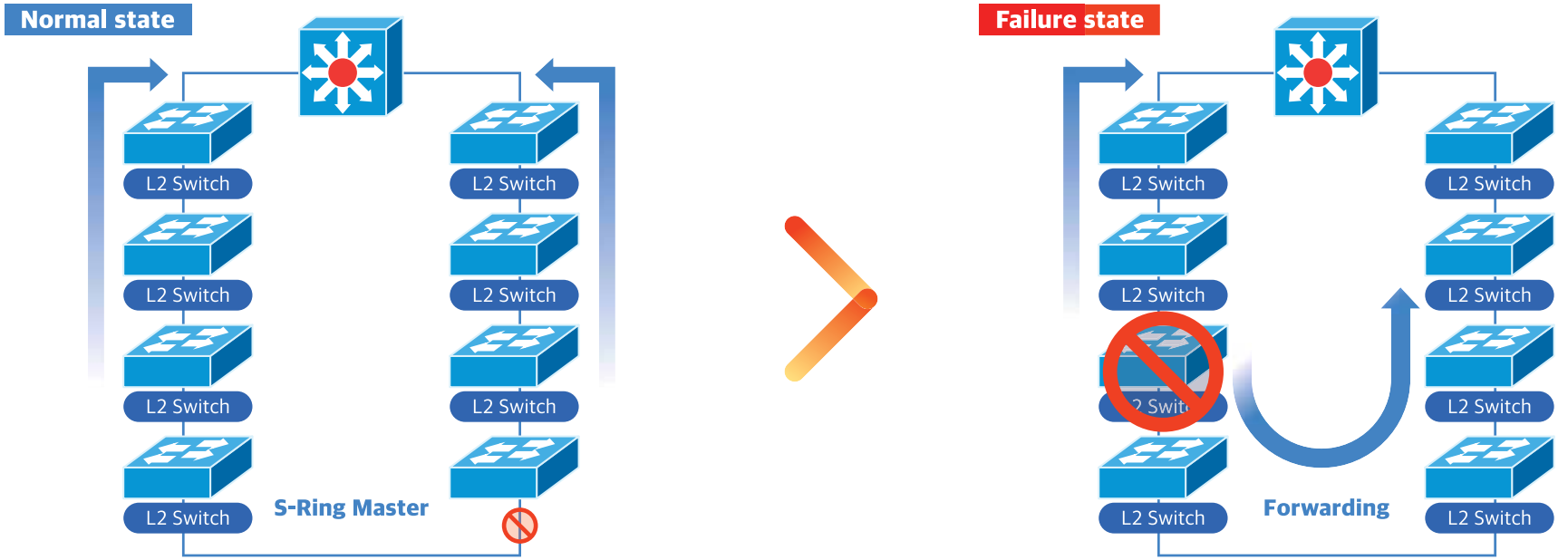
Comparison between Protocol Redundancy Configuration and Stack Redundancy Configuration



Soltech supports L2 Switch redundancy with S-Ring - Quick ring network configuration with easy setup.

- Soltech's Scan Manager program allows quick IP configuration, S-Ring monitoring, and fast IP configuration and S-Ring setup/monitoring via the web.
- Soltech's S-Ring allows ring network construction without hop count limitations. (Spanning Tree Protocol has a maximum hop count limit of 40)
- Soltech's S-Ring provides rapid switchover within 50ms or less and recovery within 10ms or less, equivalent to ERPS (Ethernet Ring Protection Switching) functionality. (whereas Spanning Tree Protocol takes 2-3 seconds)
- Network design consulting, construction technical support, and failure handling technical support are available.
  (on-site support/remote support/phone support after consultation)

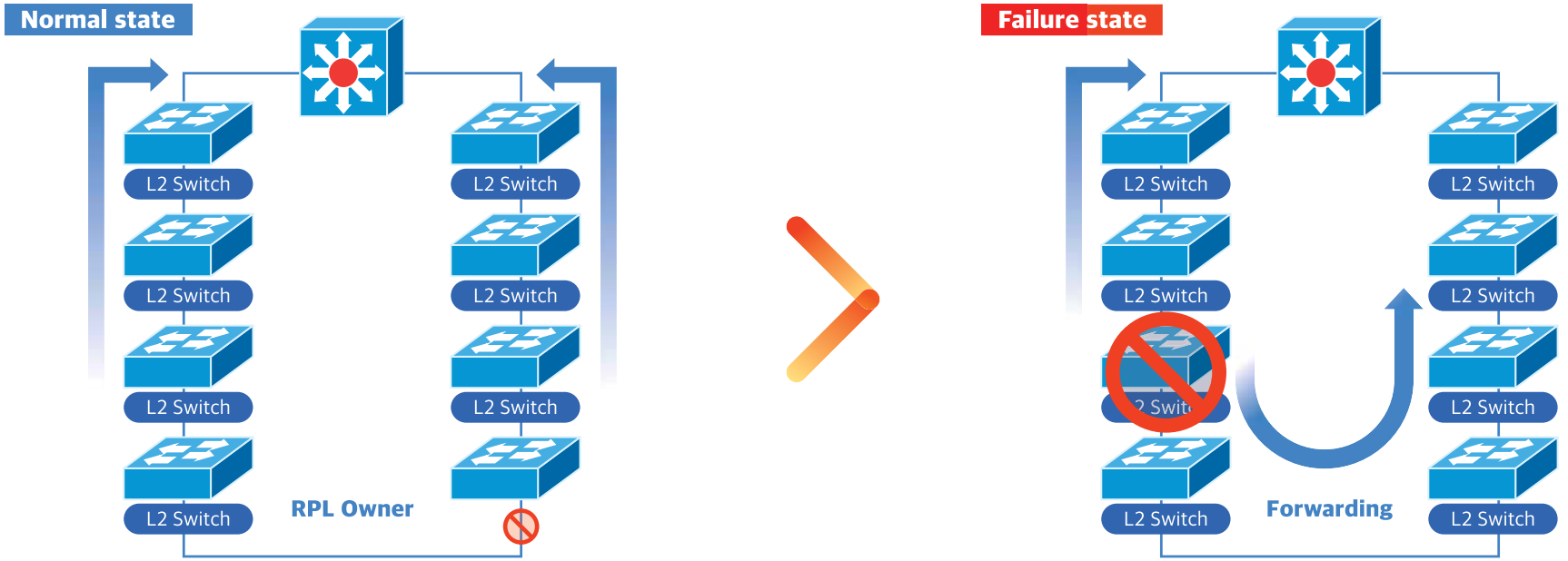
Designing a ring configuration using S-Ring redundancy protocol



Soltech supports G.8032 ERPS for L2 Switch redundancy configuration
- Effectively configure a ring network compatible with other vendors' products.

- Utilize Soltech's ScanManager program for quick IP configuration, rapid IP configuration and ERPS setup/monitoring via the web.
- With Soltech's ERPS product, it is possible to build a ring network without hop count limitations. (whereas Spanning Tree Protocol has a maximum hop count limit of 20-40)
- Soltech's ERPS product provides rapid switchover and recovery time within 50ms or less. (whereas Spanning Tree Protocol takes 2-3 seconds)
- Network design consulting, construction technical support, and failure handling technical support are available.
  (on-site support/remote support/phone support after consultation)

Designing a ring configuration using ERPS redundancy protocol

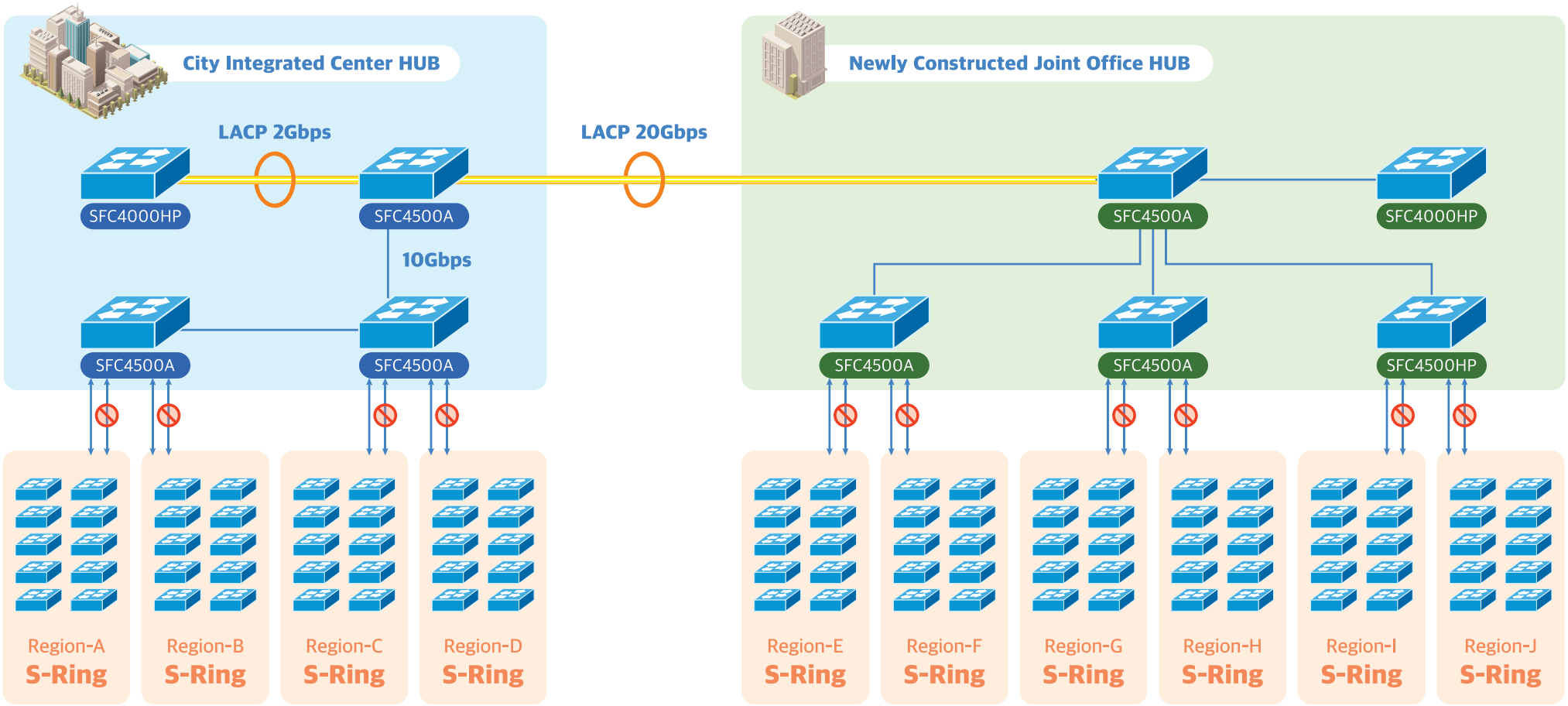


Examples of Network Construction

- Utility-pipe conduit facilities surveilance network configuration
- University CCTV and access control network configuration 1
- University CCTV and access control network configuration 2
- Airport duty-free shop CCTV network configuration
- Apartment CCTV network configuration
- Solar power plant facility and CCTV network construction
- Performance venue VoIP and data network construction
- High school switch configuration
- Public institution video surveillance network switch configuration
- Dam facility and video network configuration
- Resort network configuration
- Life science complex CCTV network configuration
- District office S-net project
- Transportation facility power control network construction project
- Mixed-use building CCTV network construction
- Transportation corpration power management configuration
- Logistics center CCTV network construction
- Paint company network configuration
- Department store duty-free shop CCTV network configuration
- Public parking lot new construction project
- Parcel logistics terminal configuration (1200 cameras)
- Transportation corpration data network and signal control configuration
- Utility-pipe facilities fire monitoring network project
- Company substation network configuration

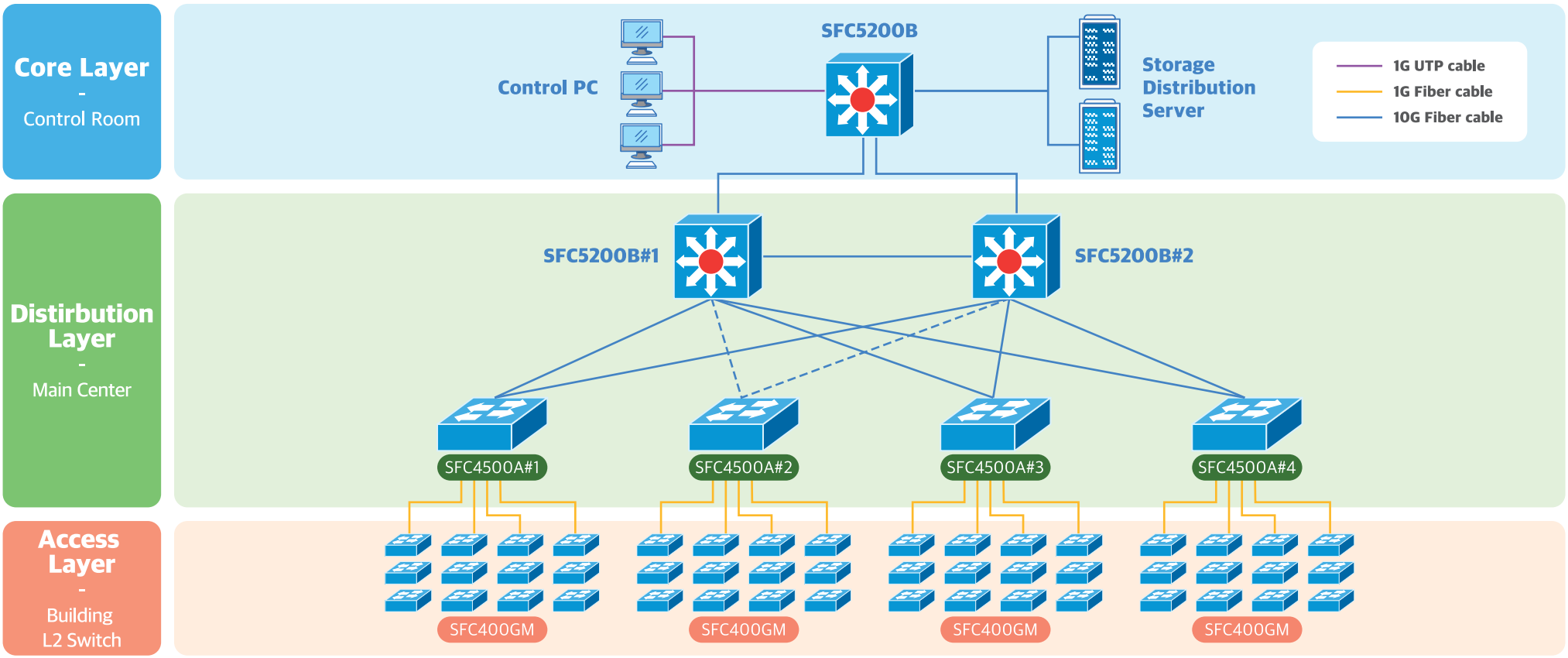
Utility-pipe conduit facilities surveilance network configuration

- Overview : Connecting the City Integrated Center and newly constructed Utility-pipe conduit Office, a comprehensive redundancy service request.
- Features : Applying our proprietary S-Ring protocol to our industrial switches, achieving redundancy configuration for each zone and establishing a 20G LACP connection between the centers.



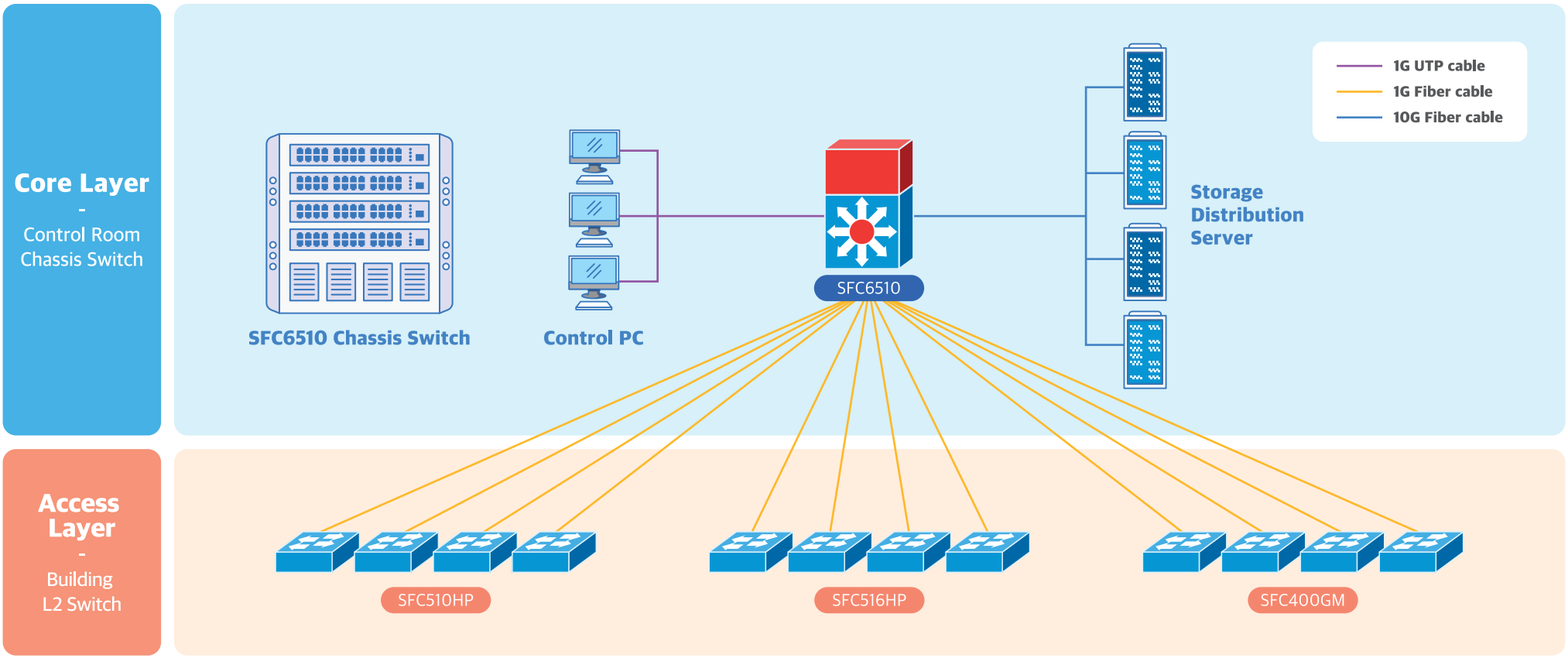
University CCTV and access control network configuration 1

- Overview : New CCTV network construction project.
- Features : To connect multiple buildings, the network is structured in a three-tier configuration with 10G switches (SFC5200B and SFC4500A) at the distribution layer for port expansion, and a core network is formed with L3 switches. IP subnet division is implemented for video and access control, ensuring stability.



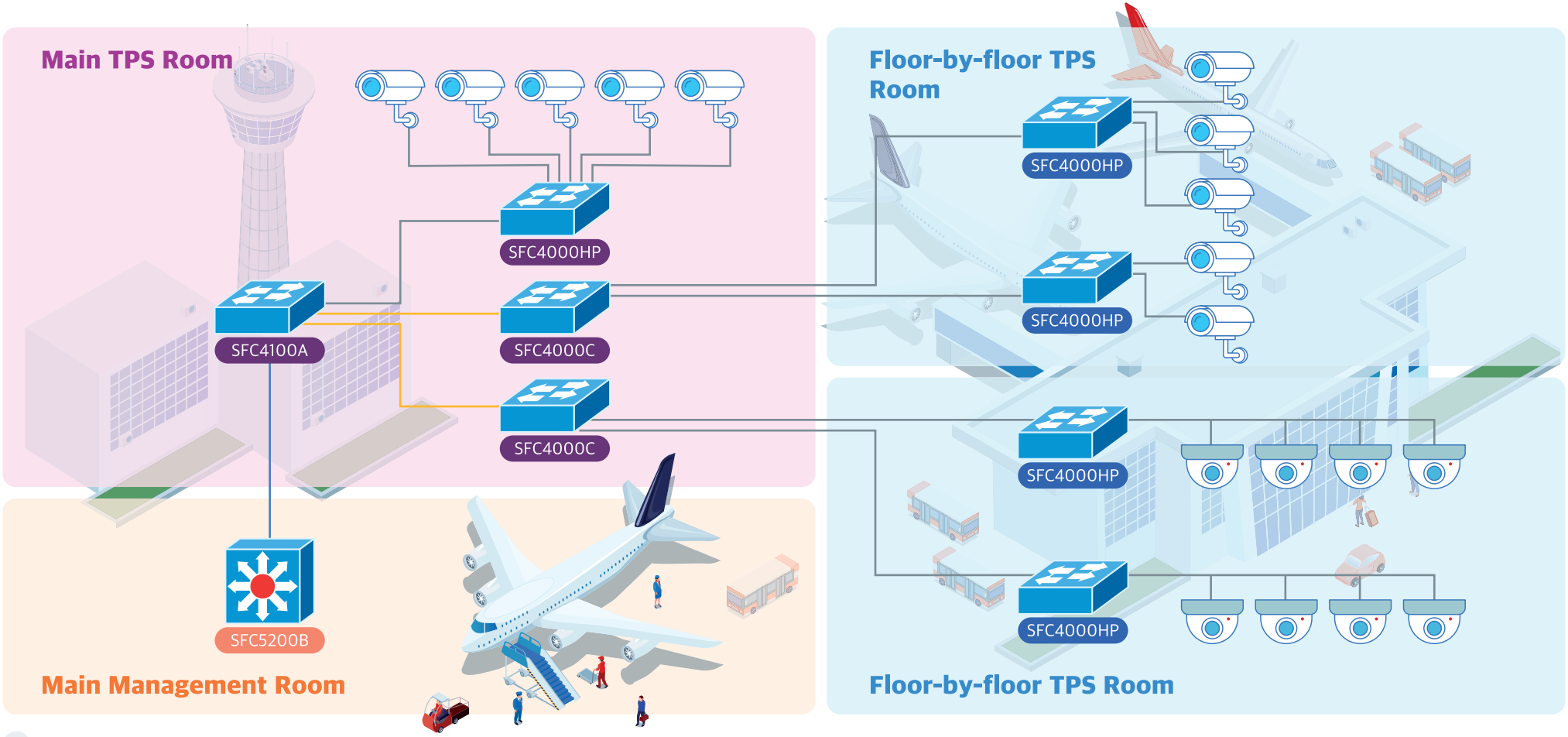
University CCTV and access control network configuration 2

- Overview : New CCTV network construction project.
- Features :To connect multiple buildings, a chassis-type backbone switch is introduced to handle the core and distribution roles, and the network is configured with access switches in each building. IP subnet division is implemented for video and access control, ensuring stability.



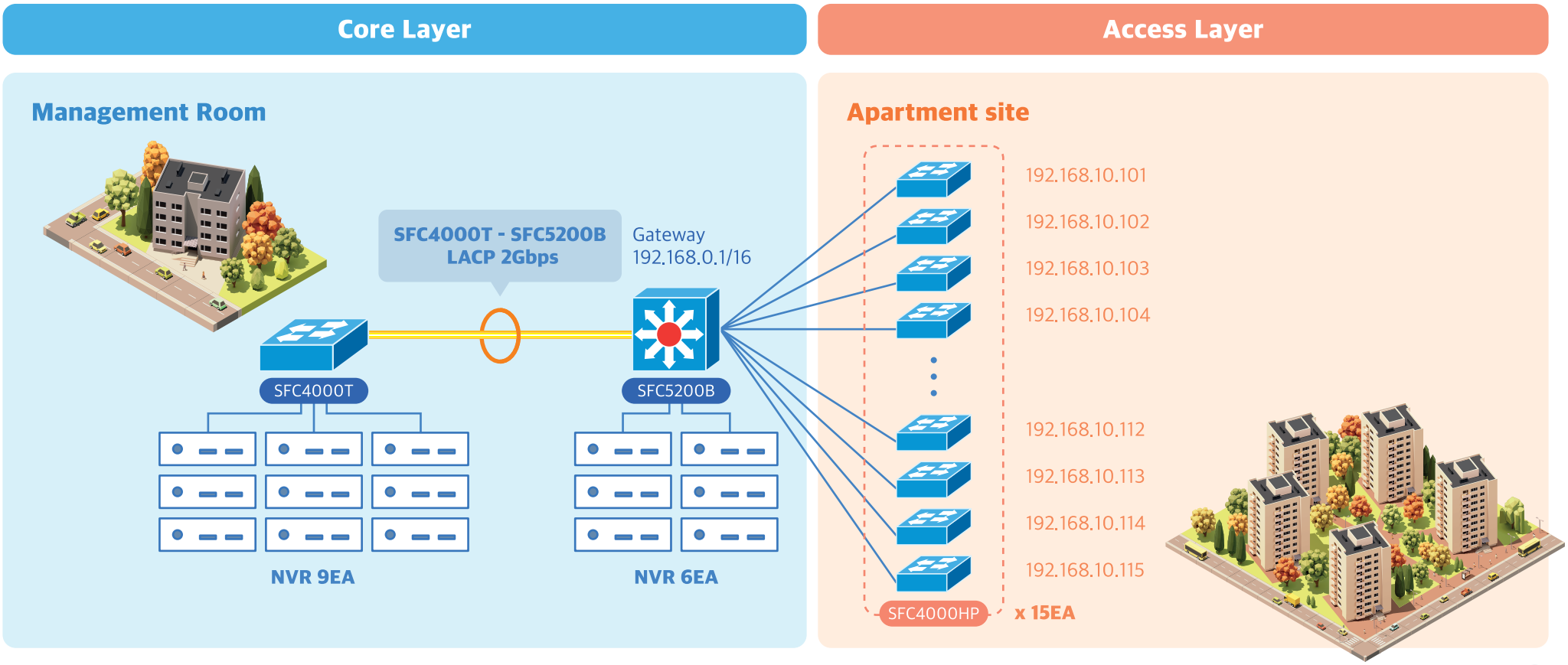
Airport Duty-Free Shop CCTV Network Configuration Diagram

- Overview : New CCTV network construction project.
- Features :To connect multiple floor-level PoE switches, SFC4100A is used as a distribution switch, and configured with L3 switch SFC5200B at 10Gbps to ensure smooth traffic delivery.



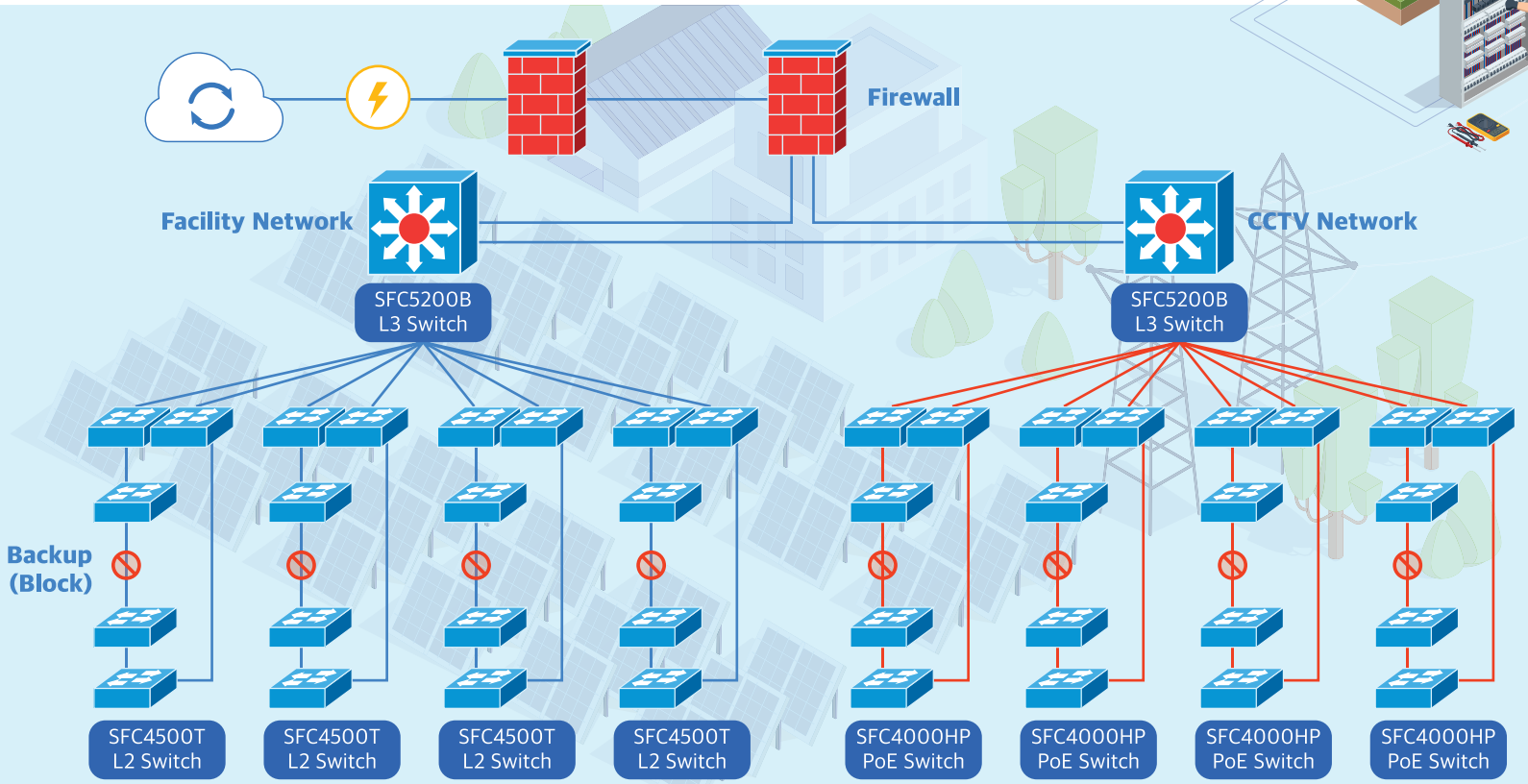
Apartment CCTV Network configuration Diagram

- Overview : Apartment New CCTV Network Construction Project.
- Features : To connect multiple zone-specific PoE switches, SFC5200B is used as the core switch, and configured with SFC4000T and SFC5200B with LACP at 2Gbps to ensure smooth traffic delivery.



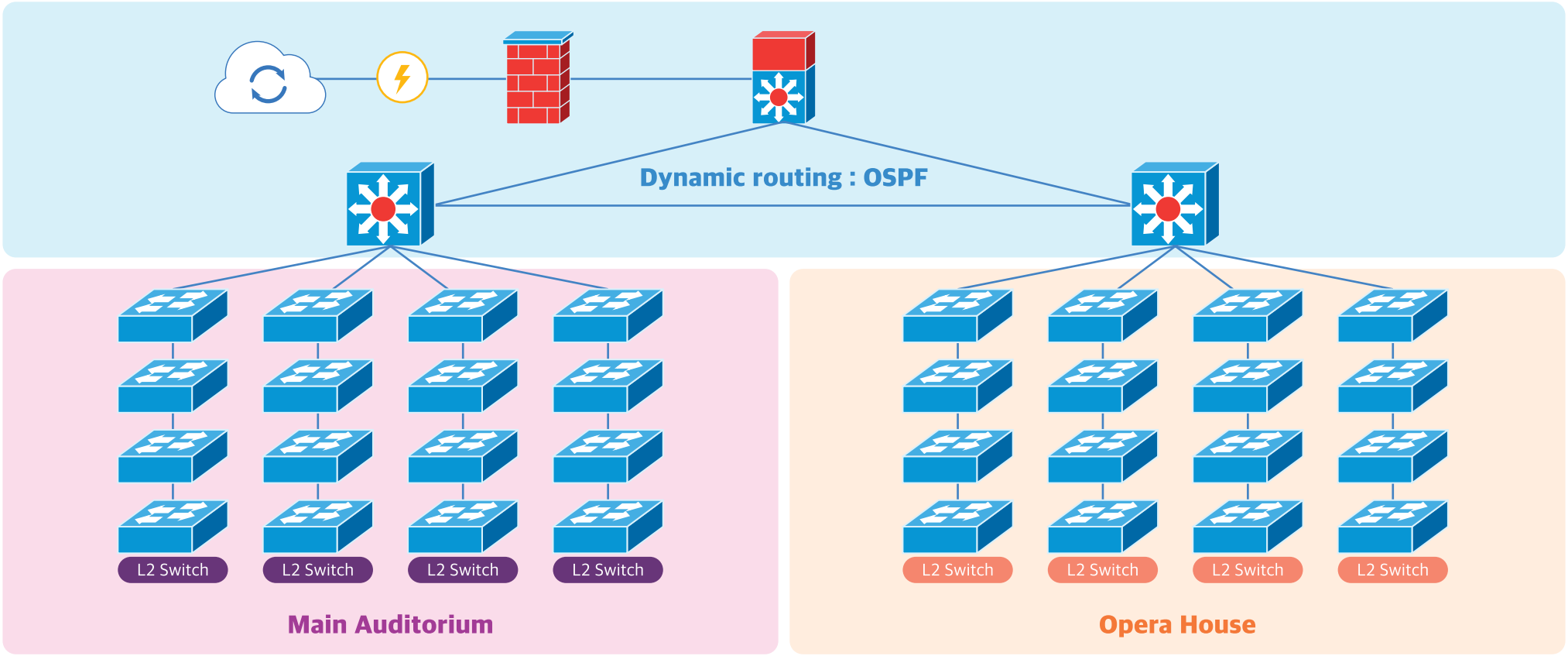
Solar power plant Facility and CCTV network construction

- Overview : Construction of a facility network for measuring/control of power generation and a CCTV network for monitoring in a solar power plant site.
- Features : Applying top-level firewall redundancy and link redundancy using L3's VRRP. Designed with L3 & L2 switch ring configuration to ensure continued network operation even in the event of network equipment/circuit failures.



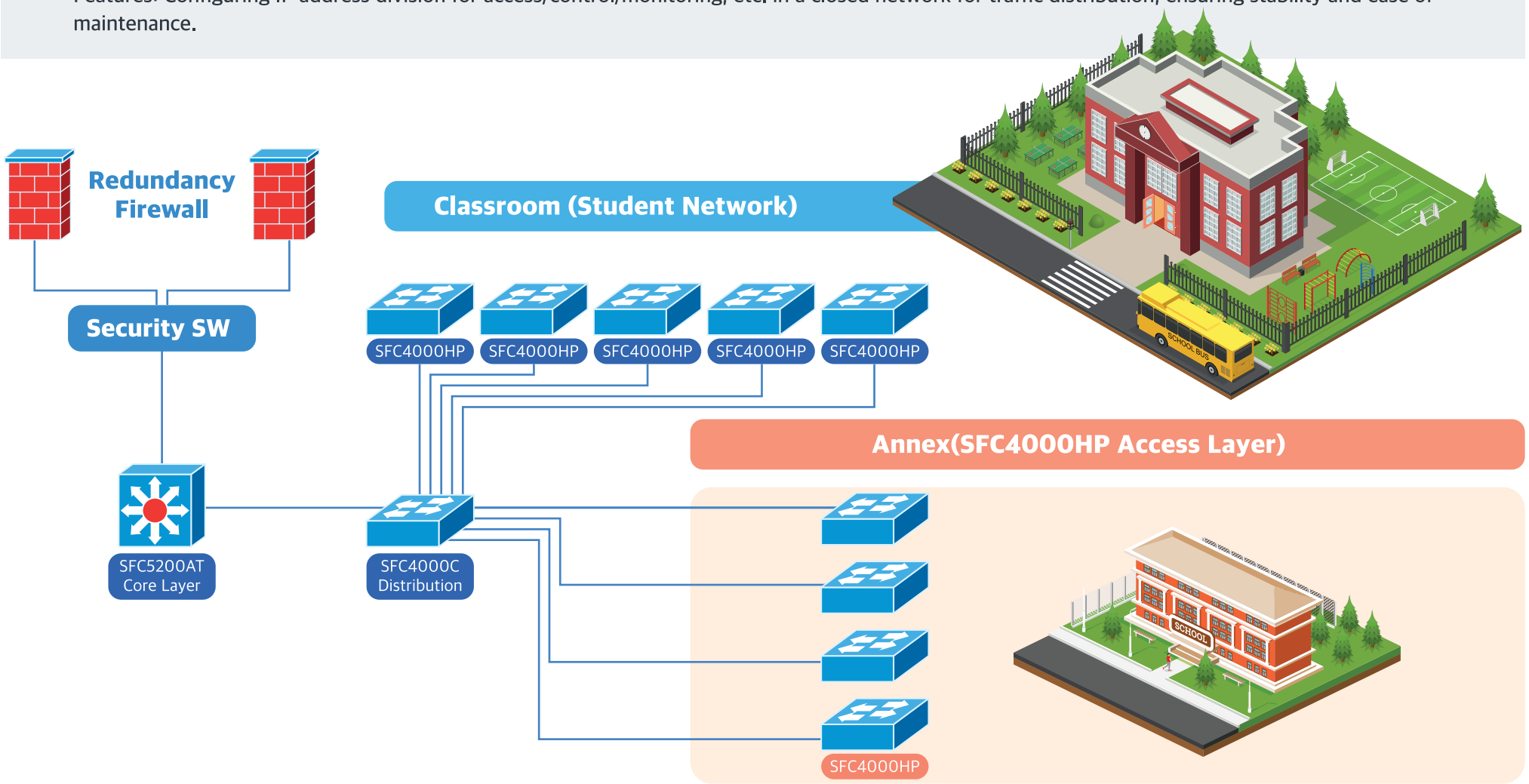
Performance venue VoIP and data network construction

- Overview: Introducing L3 to the current site which is simply composed of L2 in order to build a smooth and flexible network.
- Features: Simultaneous configuration of Internet Phone (VoIP) and Internet Data Network to provide convenience to users, configured to allow stable and easy maintenance. using secondary VLANs to separate VLANs of each department, linked with top-level CISCO backbone, and capable of building a smooth network using Dynamic routing (OSPF).



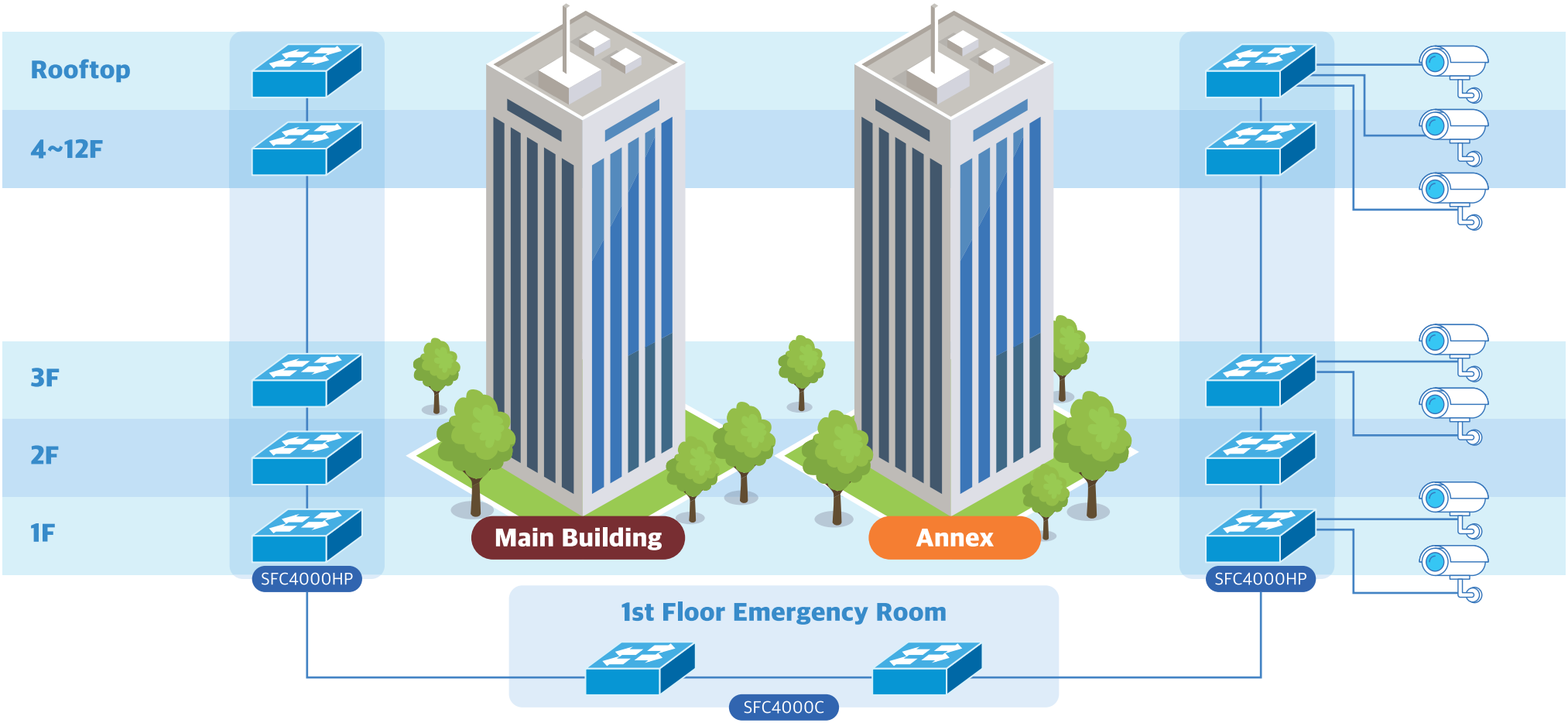
High School Switch Configuration

- Overview: Network configuration with Soltech switch for new CCTV camera installation project.
- Features: Configuring IP address division for access/control/monitoring, etc. in a closed network for traffic distribution, ensuring stability and ease of maintenance.



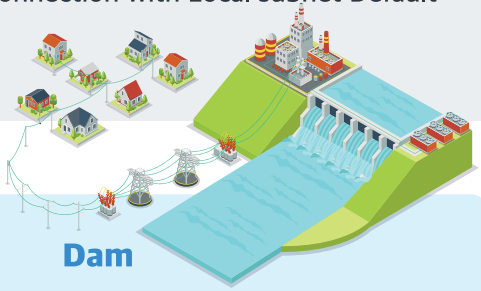
Public Institution Video Surveillance Network Switch Configuration

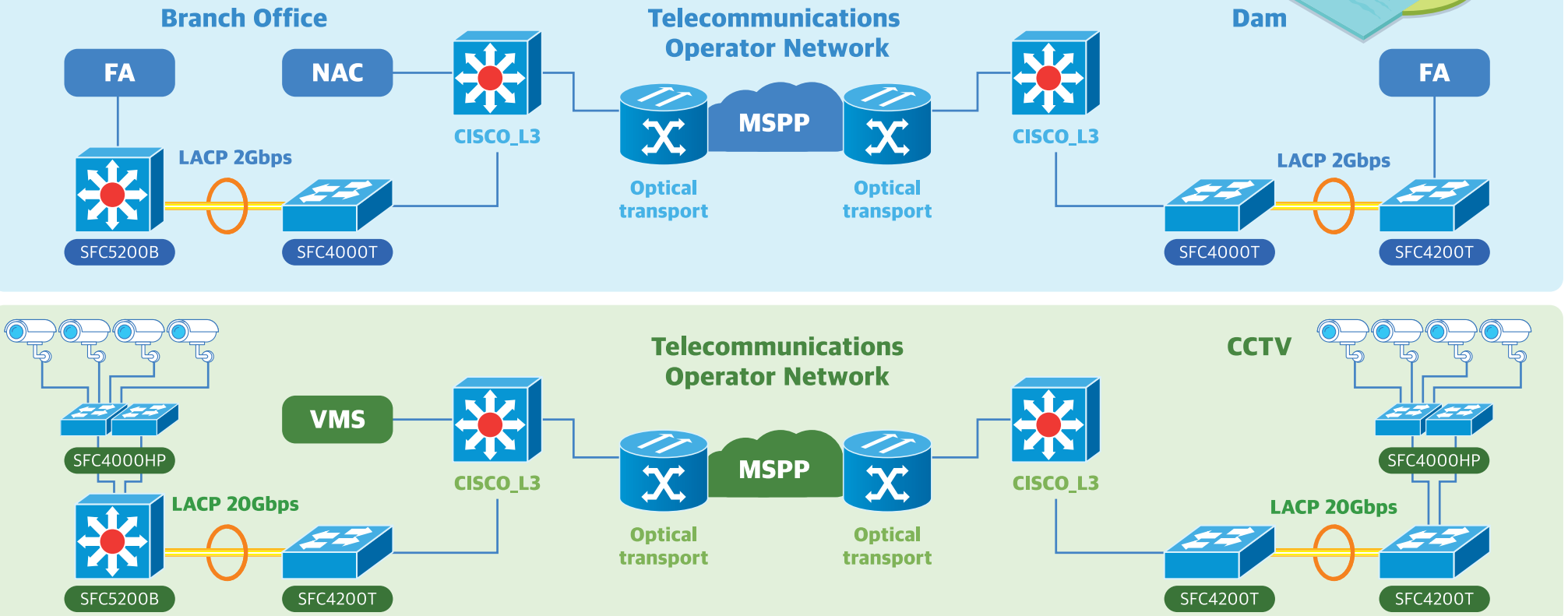
- Overview : Network configuration using Soltech switch equipment for a new security camera installation project in a public institution.
- Features : Establishing Network Segmentation for Access/Control/Surveillance IP Ranges within a Closed Network for Traffic Distribution, Stability Enhancement, and Maintenance.



Dam facility and video network configuration diagram

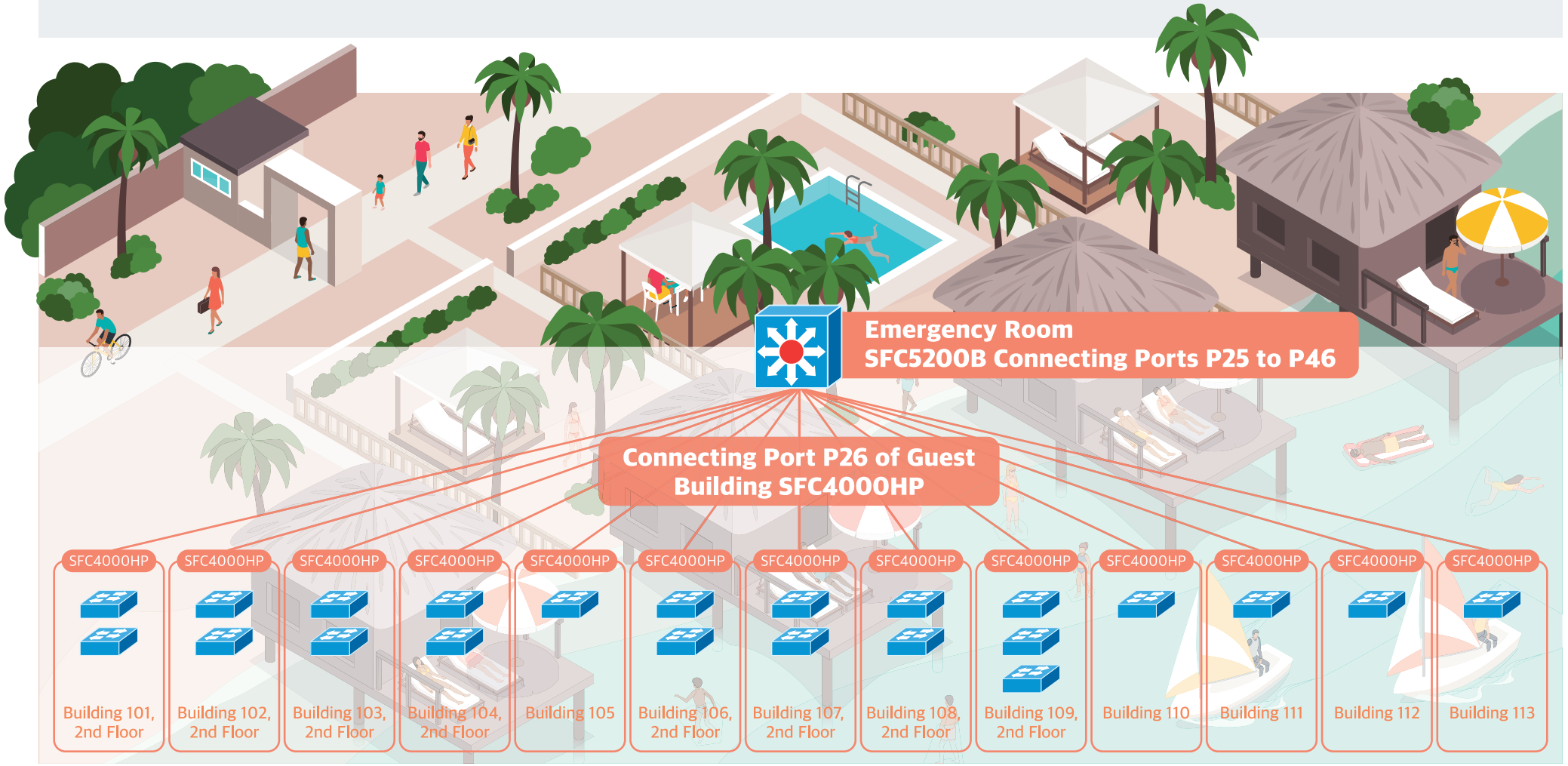
- Overview: Configuration of dam facility (FA) and CCTV network.
- Features: Increased bandwidth and support for line redundancy through the use of LACP between devices, top-level connection with Local subnet Default Gateway setting Remote or direct connection of each device allows IP and protocol permission by the administrator, while blocking others to proceed with device security settings.





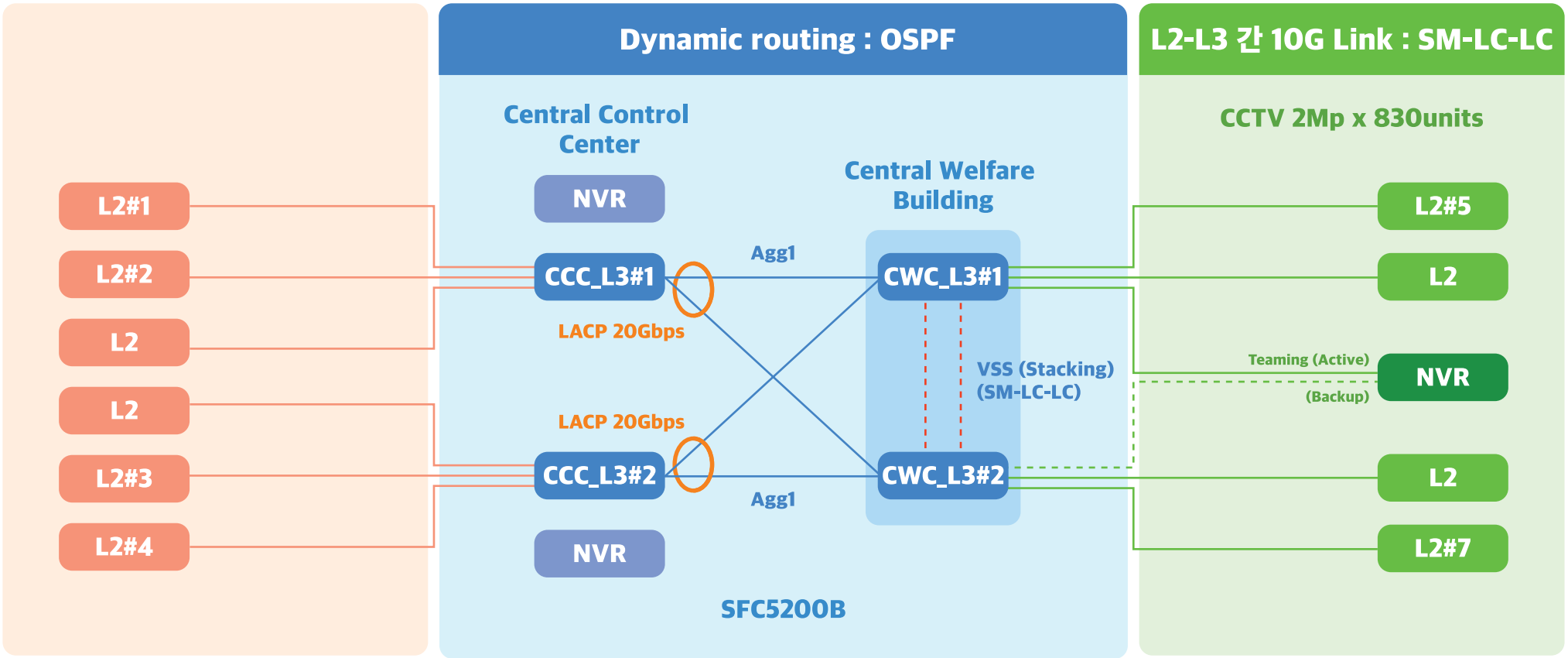
Resort Network Configuration

- Overview : Integrated network design for the resort premises.
- Features : VLAN configuration for internal and external traffic control within the resort, along with integrated IP address ranges to manage traffic effectively.



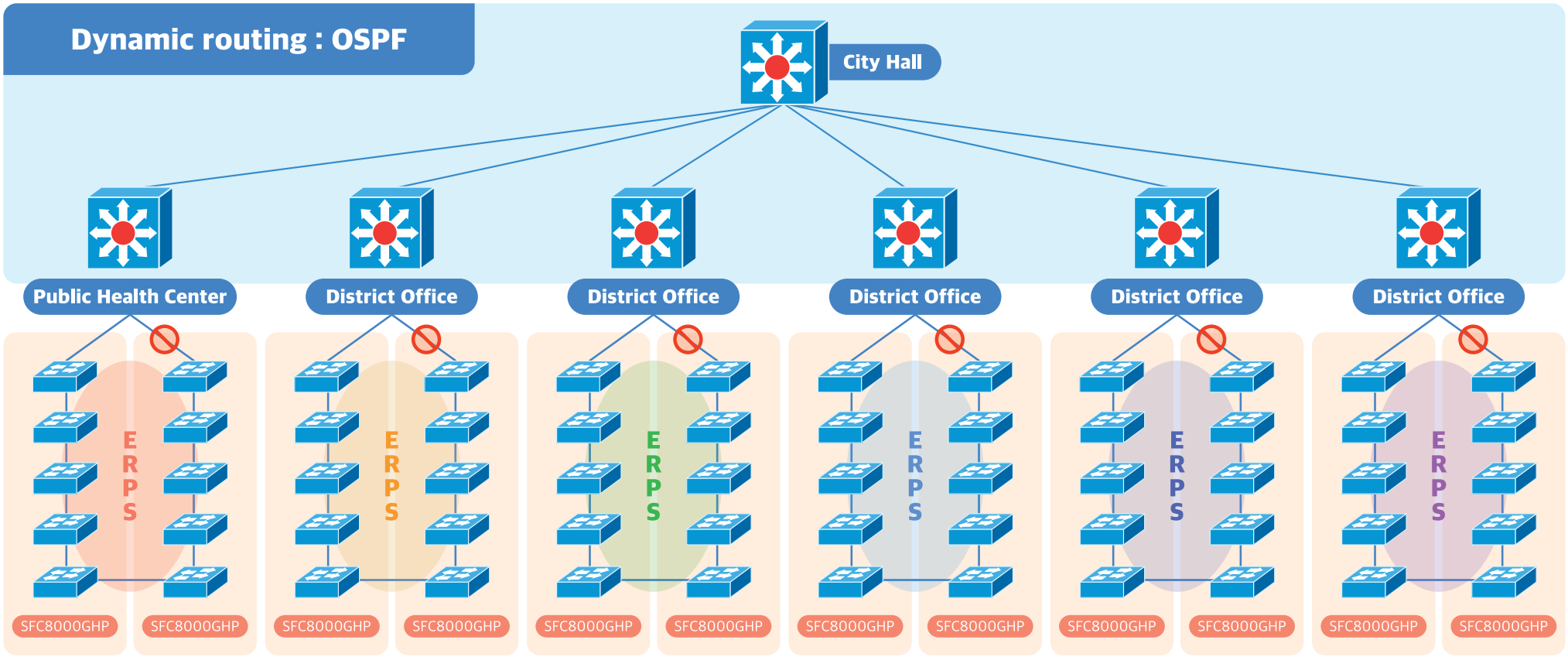
Life Science Complex CCTV Network Configuration

- Overview: Installation site of over 800 CCTV cameras. Request for dual redundancy with NVR in the Central Welfare Building and request for separation of video bandwidth for each region.
- Features: Stacking is implemented with VSS configuration in the Welfare Building, and each L3 OSPF is configured for routing of each network segment. Physical links are configured with 10G LACP for link redundancy.



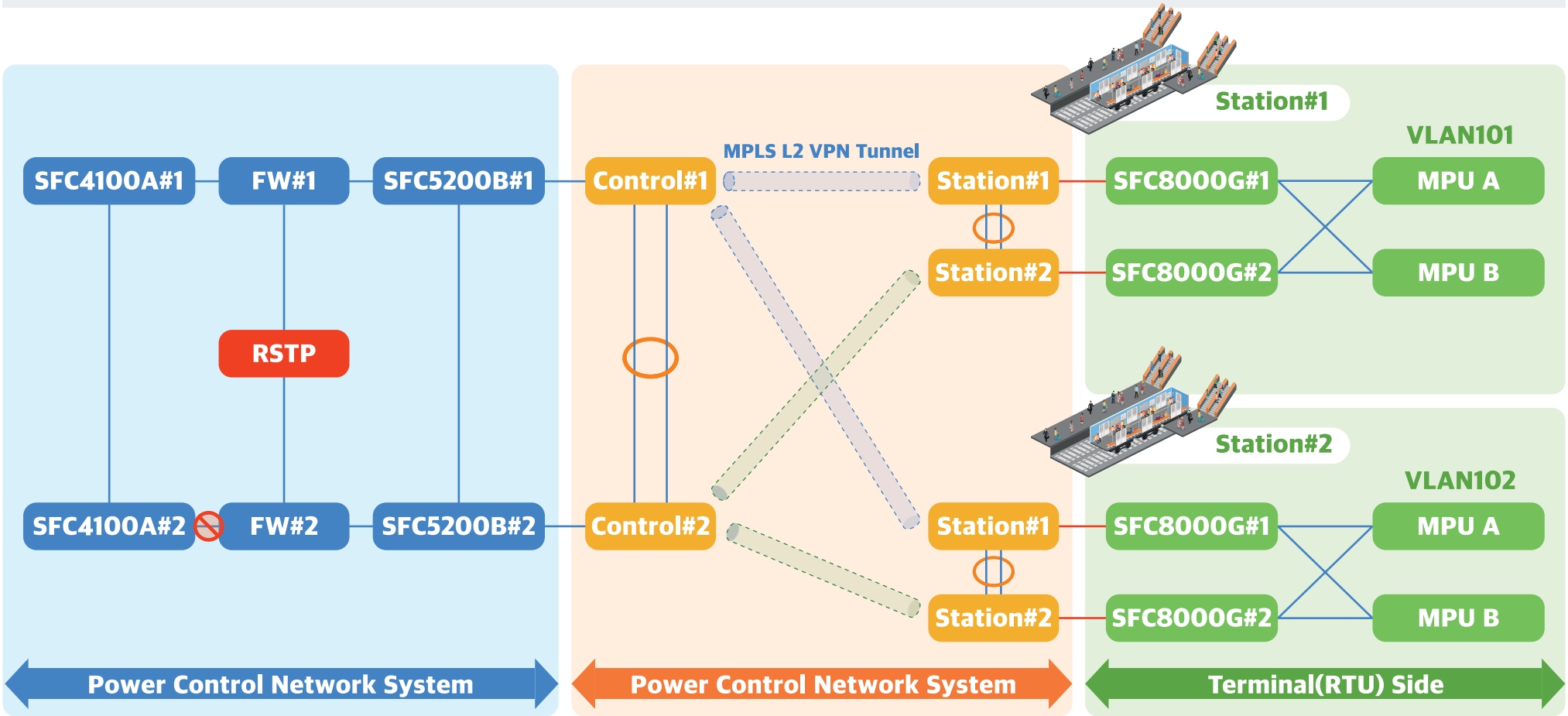
District office S-net project

- Overview: Top L3 switch uses dynamic routing to build a communication network for local government security CCTV and public Wi-Fi.
- Features: Design applied with Ring configuration using ERPS Protocol of SFC8000GHP for swift network 50ms switching operations, which enables continuous data transmission even if some equipment fails. Provides high-level technical support by supplying self-developed industrial switches.



Transportation facility power control network construction project

- Overview: Configuration of power control network system using MPLS communication network in underground subway transportation facilities.
- Features: Dual configuration of upper and lower levels using RSTP between switch rooms, dual configuration of IP GW for host redundancy at the lower level, VLAN configuration between stations for L3 tagging settings, access settings at the lower level for interconnection with transmission equipment, and blocking of broadcast and multicast through VLAN usage.

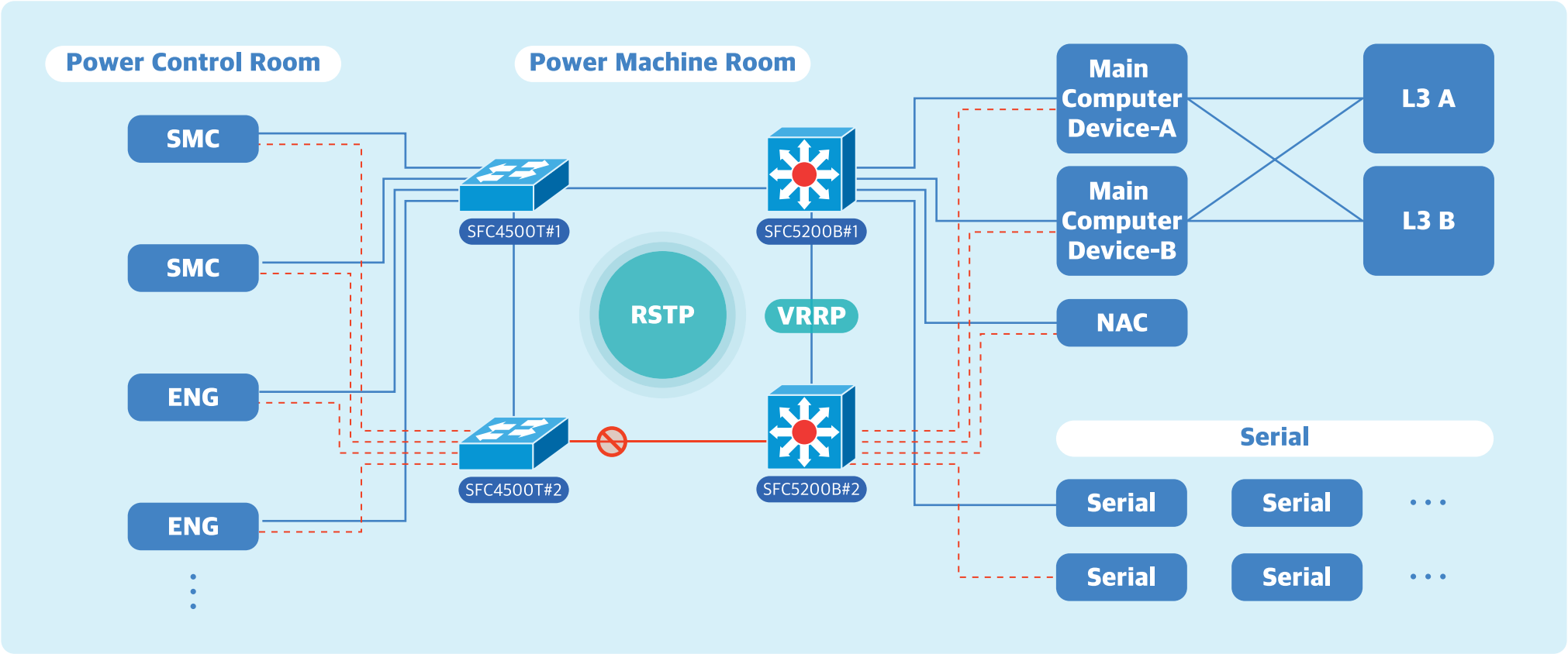


Mixed-use building CCTV network construction

- Overview: Construction of access control and CCTV network for a mixed-use building.
- Features: Utilization of SFC5200B with other vendor backbone switches for the construction.
  Separation of the entire network to minimize factors causing failures due to broadcasts. Completion of construction ensuring seamless integration with building backbone for convenience of use.

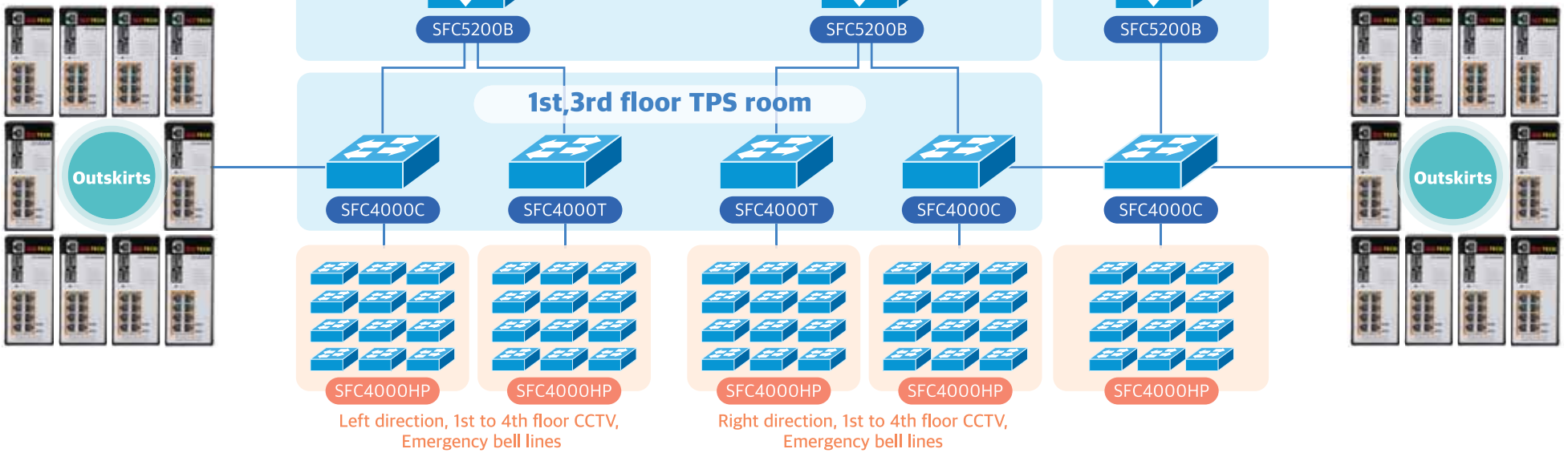
Transportation Corporation Power Control Configuration

- Overview : Configuration of power control network system for transportation corporation.
- Features: Use of RSTP between switches, system configured with lower host redundancy and IP GW redundancy to secure backup path within the network Continuous system service possible with minimal network failure.



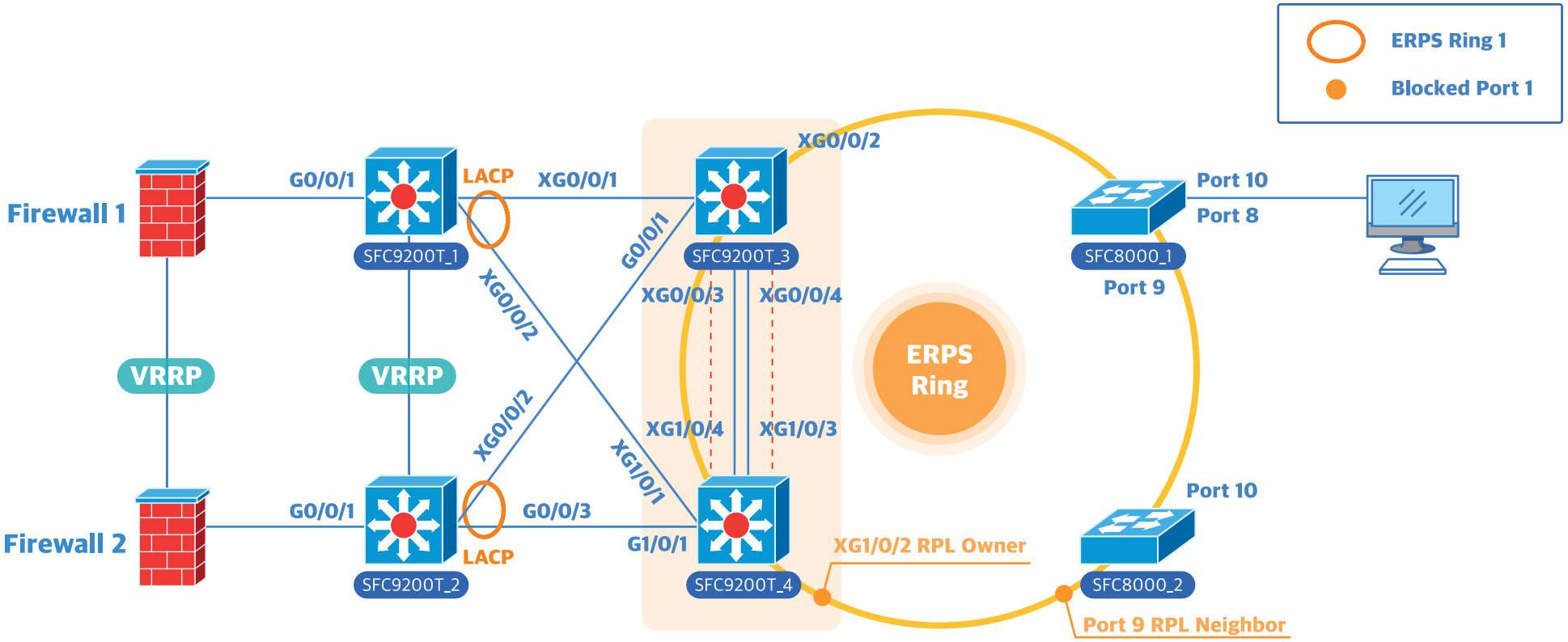
Logistics center CCTV Network construction

- Overview : Construction of a CCTV network for the logistics center using Soltech equipment.
- Features : Utilization of dual monitoring in the disaster control room and security building, ensuring 10G data flow connectivity, dedicated isolation feature for camera ports.



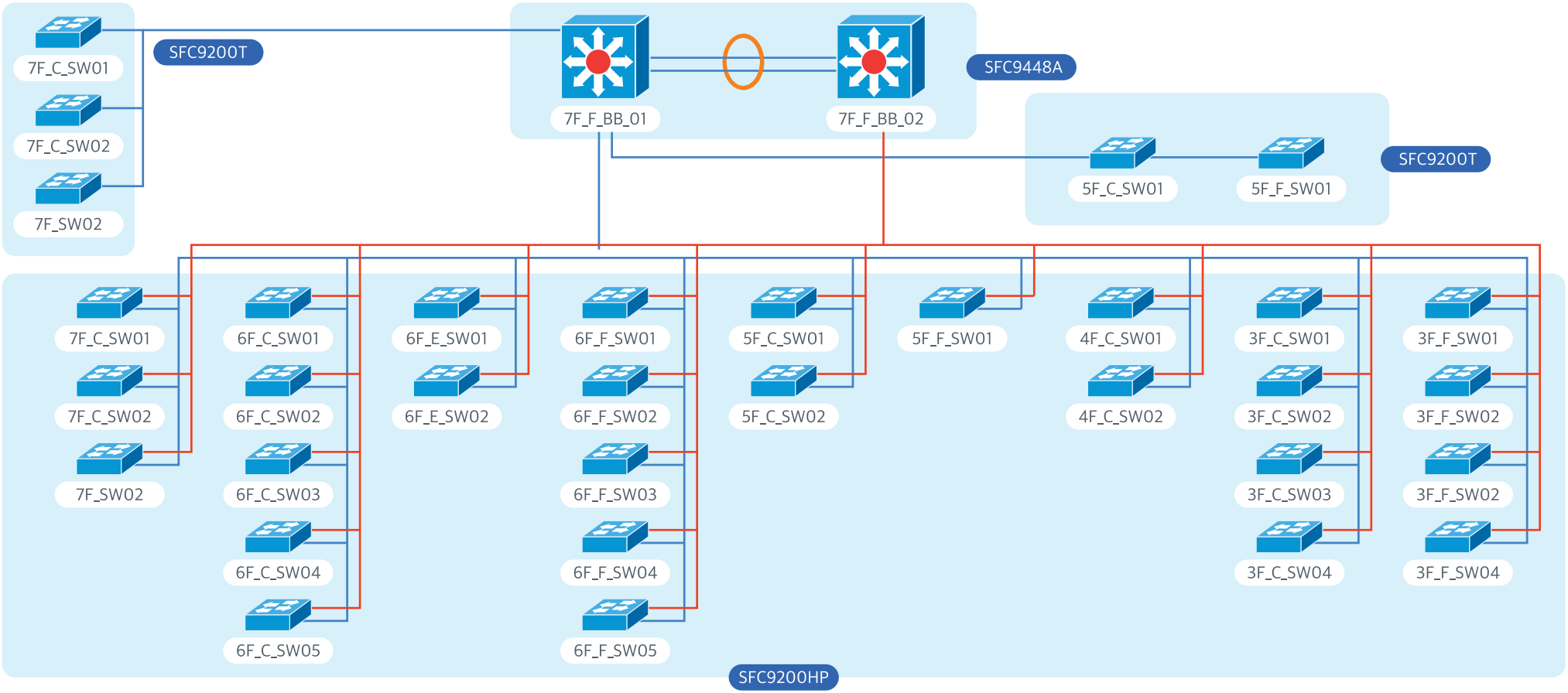
Paint Company Network Configuration Diagram

- Overview: A paint company requested the configuration of SFC9200T VSS(Virtual Switching System) for stack configuration.
- Features: Two SFC9200T devices for L3 are configured as Master-Backup using VRRP at the top.
  Two SFC9200T devices for VSS are configured as a stack and connected to the top using LACP, forming a ring with SFC8000 and ERPS v2.



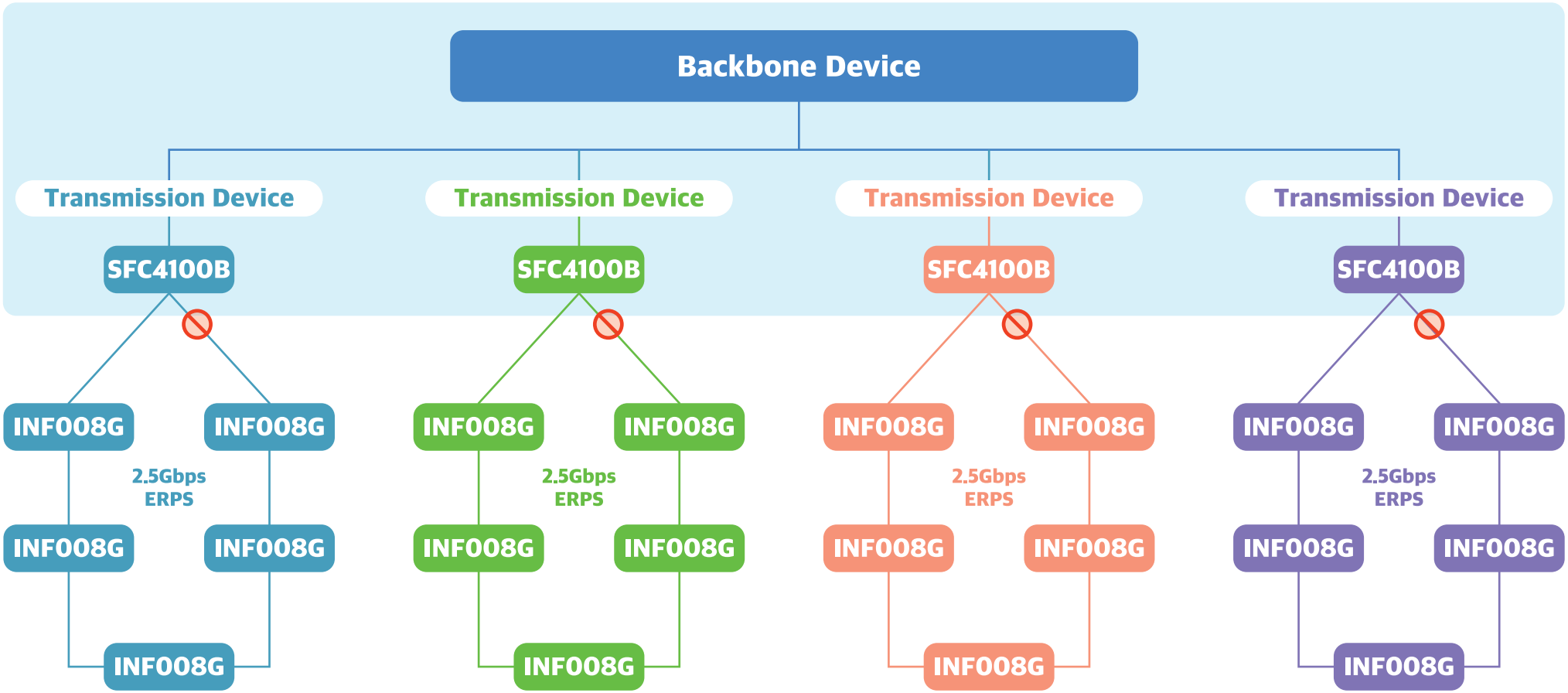
Department Store Duty-Free Shop CCTV Network Configuration

- Overview : Construction of CCTV network for duty-free shops located in Seoul.
- Features : Dual redundancy with VRRP on 2 L3 switches SFC9448A and physical redundancy configuration of uplinks from SFC9200HP PoE switches using RSTP.



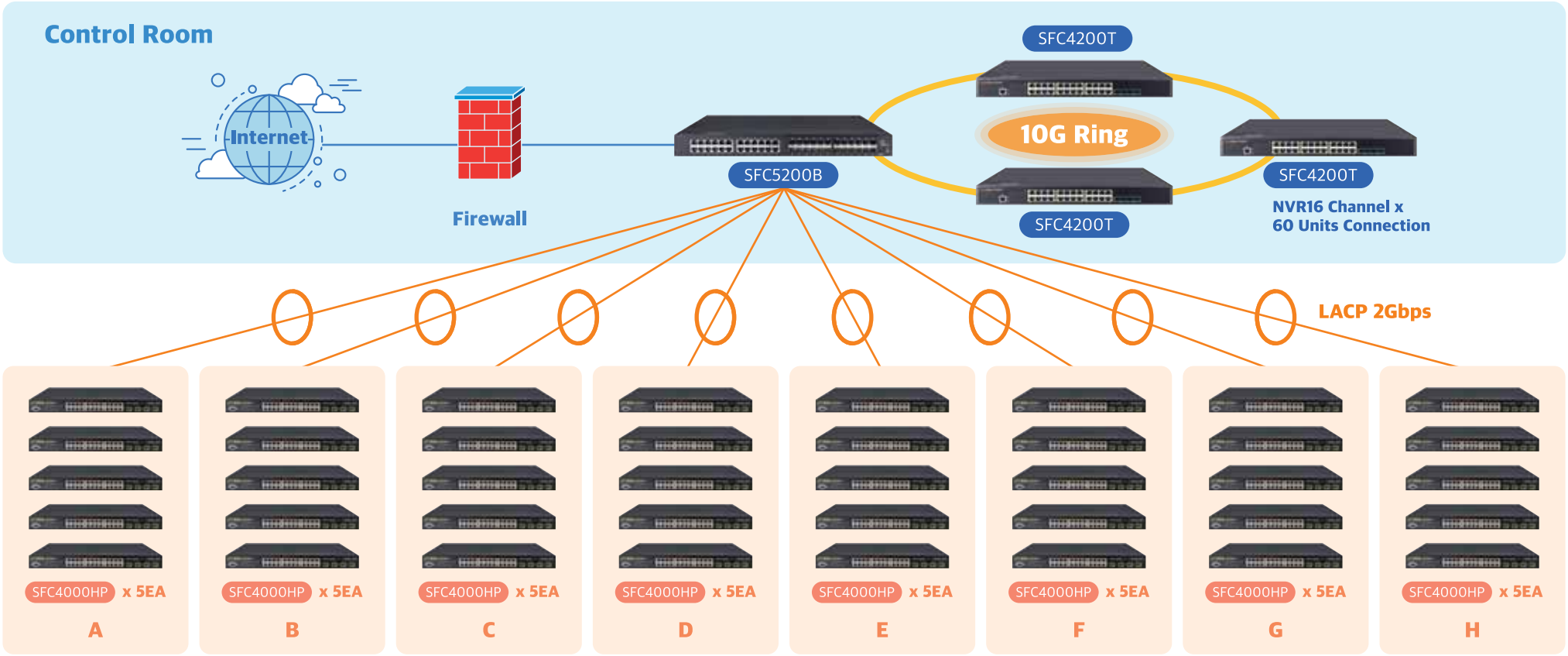
Public parking lot new construction project

- Overview : Construction of CCTV network for with Soltech manufactured equipment.
- Features : Construction of camera network and emergency alarm network using 2.5Gbps ERPS and VLAN for each section of public parking lot, and optimization of network traffic.



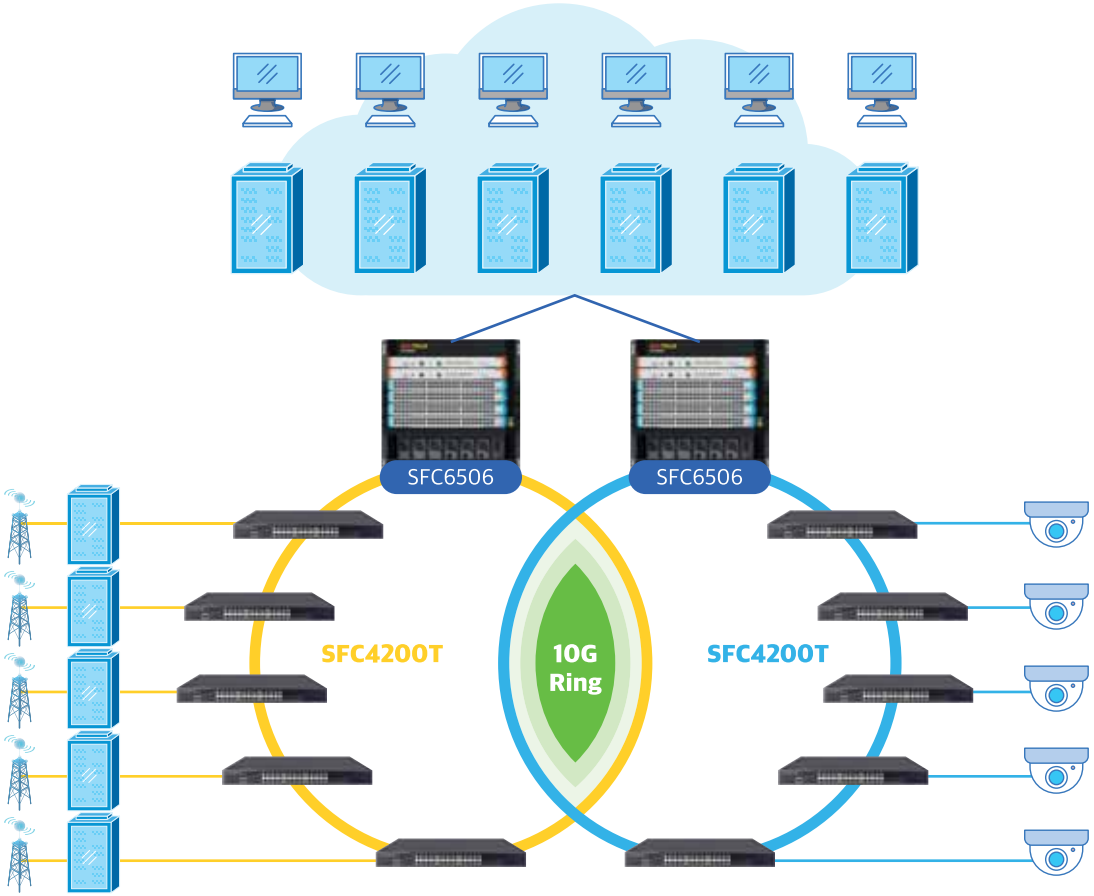
Parcel Logistics Terminal Configuration (1200 Cameras)

- Overview : Configuration of a CCTV network for operational management of a parcel delivery company's logistics center.
- Features : Utilization of L3-PoE setup with LACP 2Gbps for each area to enable smooth video traffic transmission. Establishment of a 10Gbps ring for Situation Room NVR connection. Installation of network firewall equipment for remote access to Situation Room video from off-site offices.



Transportation Corporation Data Network & Signaling Control

- Overview : Data Network - Establishment of Control Broadcasting and Spatial Imaging, TRS Network, and NMS Network.
- Features : Configured and Established Using Ring Dedicated Protocol, Completed Setup. Stable Operation Across 31 Stations of Line 1 and 26 Stations of Line 2.



Server & Monitoring system

1 Transportation Corporation Data Network

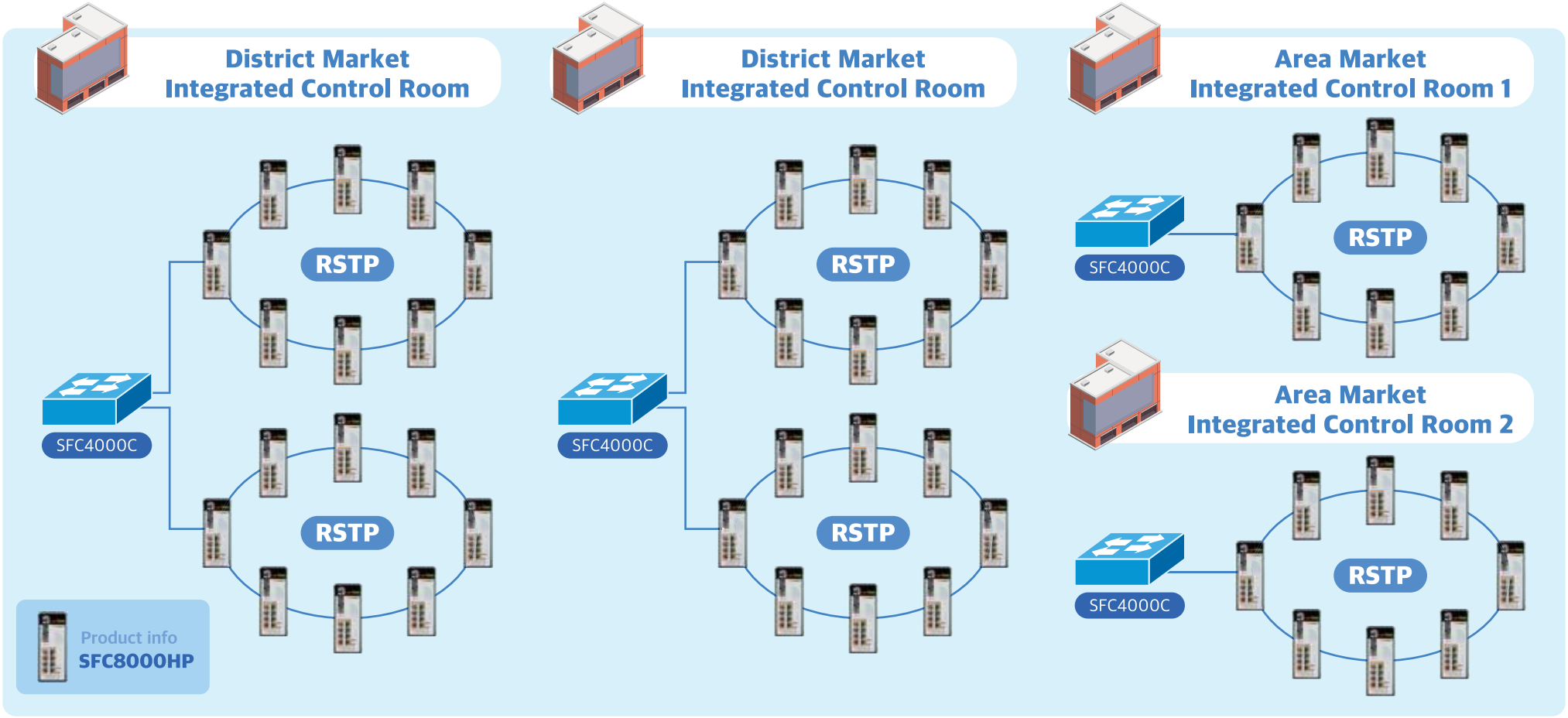
- Establishment of Control Broadcasting, Spatial Imaging, TRS Network, and NMS Network for Line 1.
- Utilization of Ring Protocol, Successfully Configured and Established.
- Stable Deployment Across 31 Stations.
- Currently Maintaining Smooth Communication, No Reported Instances of Failures.

2 Transportation Corporation Signaling Control Network · Establishment

- Establishment of Network for Signaling Control of Line 2.
- Utilization of Ring Protocol, Successfully Configured and Established.
- Stable Deployment Across 26 Stations.
- Currently Maintaining Smooth Communication, No Reported Instances of Failures.

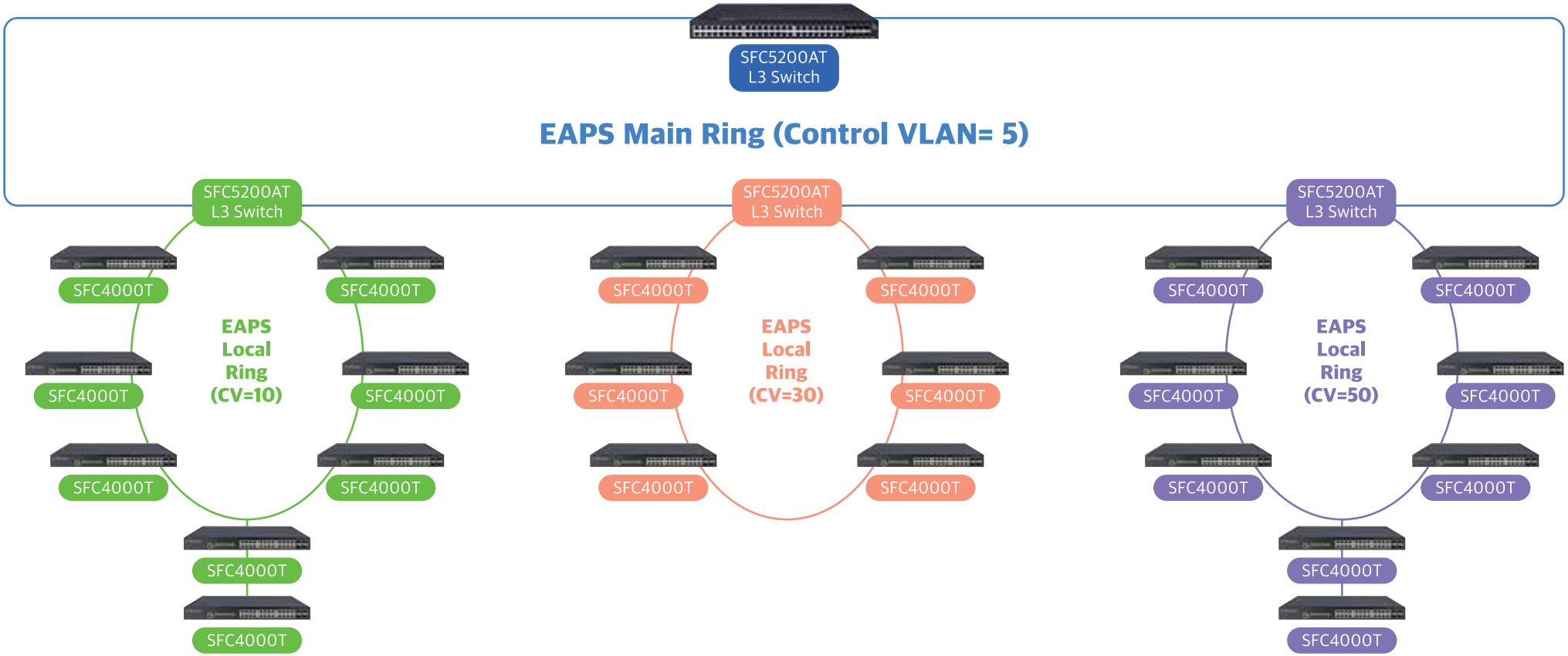
Utility-pipe facilities Fire Monitoring Network Project

- Overview :Project to add fire monitoring cameras to 4 locations in city joint District.
- Features : The project involves additional work on the existing S-ring configuration related to the joint district project. The equipment functionality will be changed from S-ring to RSTP to recover from any disconnections and ensure stability.



Company Substation Network

- Overview : Equipment replacement and network stabilization project due to the aging of equipment used in the company's substation network.
- Features : The project involves replacing the existing O-ring equipment with a mixture of STP to address irregular network failures. Subsequently, the equipment will be replaced with our own devices and the network will be configured for stability using the Ethernet Automatic Protection Switching (EAPS) protocol.



Industrial switch

Model Name	TP Port	PoE Port	SFP Port	Remarks	Certification
SFC8000	1Gbps TP 8 Port	-	1G/2.5G SFP 2 Slots	Operating Temperature: -40~80℃, S-Ring, Redundant Power	FC / CE
SFC8000HP	-	1G PoE 8 Port, PoE 240W	1G/2.5G SFP 2 Slots	Operating Temperature: -40~80℃, S-Ring, Redundant Power	FC / CE
SFC8000G	1Gbps TP 8 Port	-	1G SFP 2 Slots + 1G/2.5G SFP 2 Slots	Operating Temperature: -40~80℃, S-Ring, Redundant Power	FC / CE
SFC8000GHP	-	1G PoE 8 Port, PoE 240W	1G SFP 2 Slots + 1G/2.5G SFP 2 Slots	Operating Temperature: -40~80℃, S-Ring, Redundant Power	FC / CE

PoE switch

Model Name	TP Port	PoE Port	SFP Port	Remarks	Certification
SFC510HP	1Gbps TP 10 Port	1G PoE 8 Port, PoE 125W	-	-	FC / CE
SFC516HP	1Gbps TP 16 Port	1G PoE 16 Port, PoE 260W	1G SFP 2 Slots	-	FC / CE
SFC4000HP	-	1G PoE 24 Port, PoE 380W	1G SFP 2 Slots	TP/SFP Combo Port (23,24)	FC / CE

L2 ethernet switch

Model Name	TP Port	PoE Port	SFP Port	Remarks	Certification
SFC400GM	1Gbps TP 8 Port	-	1G SFP 2 Slots	-	
SFC4000C	1Gbps TP 8 Port(Combo)	-	1G SFP 24 Slots + 10G SFP 4 Slots	-	
SFC4000T	1Gbps TP 24 Port	-	1G SFP 4 Slots	-	
SFC4200T	1Gbps TP 24 Port	-	10G SFP 4 Slots	-	
SFC4100A	1Gbps TP 4 Port	-	1G SFP 24 Slots + 10G SFP 4 Slots	TP/SFP Combo Port (1~4)	
SFC4500A	1Gbps TP 4 Port(Combo)	-	1G SFP 24 Slots + 10G SFP 4 Slots	Supports S-Ring, TP/SFP Combo Port (1~4)	
SFC4500T	1Gbps TP 24 Port	-	1G SFP 4 Slots	Supports S-Ring, TP/SFP Combo Port (23, 24)	FC / CE

L3 ethernet switch

Model Name	TP Port	PoE Port	SFP Port	Remarks	Certification
SFC9200T	1Gbps TP 24 Port	-	10G SFP 4 Slots	-	
SFC9200HP	-	1G PoE 24 Port, PoE 380W	10G SFP 4 Slots	-	
SFC5200B	1Gbps TP 24 Port	-	1G SFP 24 Slots, 10G SFP+ 6 Slots	Supports Redundant Power	
SFC5200AT	1Gbps TP 48 Port	-	10G SFP 8 Slots	Supports Redundant Power	
SFC9448A	-	-	10G SFP+ 48 Slots, 40/100G QSFP 6 Slots	Supports Redundant Power, 100G License Sold Separately	
Model Name	**Total Slot**	**Control Card**	**Communication Card**	**Fabric Card**	**Certification**
SFC6510	14 Slots	MCU Card 2 Slots	Line Card 8 Slots	SFU Card 4 Slots	
SFC6506	10 Slots	MCU Card 2 Slots	Line Card 4 Slots	SFU Card 4 Slots	

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SOLTECH NETWORK SOLUTION PROJECT

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