

Name of Guideline: Statement of Work for Network Design and Deployment of new Headquarters	Number: AST-SIC0098
Domain: Network	Category: Network Design and Deployment
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SeaIce Creamery

Headquarters Network Design Statement of Work

General:

SeaIce Creamery (SIC) has recently decided to expand and move its headquarters to a new location and needs technical assistance to complete the new IT infrastructure. SIC employs a small IT staff with an expertise in Help Desk support and VOIP, however they need a LAN/WAN expert to advise, design, and plan deployment of the **wired and wireless** network at this new location.

The purpose of this document is to outline who is responsible for the requirements, responsibilities, and timelines related to this task.

Guideline:

Statement of Work

SeaIce Creamery has hired Aston Technologies Inc. to provide professional services to design and plan deployment of a **wired and wireless LAN** network that can support VOIP technologies.

Aston Technologies professional services will provide technical assistance and recommendations for required hardware and technologies including, but not limited to:

- Bill of Materials (BoM).
- IP addressing scheme.
- High Level Design (HLD).

- Low Level Design (LLD).
- Maintenance Operating Procedure (MOP).

SIC will provide support from a site discovery standpoint by having its IT staff available to answer questions that may arise during the design phase of the project.

Project Goal

The goal of this project is to design and plan deployment of a new LAN network for the SIC Headquarters office, which will facilitate all their corporate staff needs. This includes voice, data, and wireless considerations. This means ensuring facility wide communication between all network devices, excluding specifically the **Finance Department (FD)**, which should only be allowed to communicate within its own subnet and the **Financial Services Proxy servers (FSP)**, which will be deployed in the MDF's. **FD** exists in the middle of the campus utilizing IDF2 exclusively. Only FD devices will be connecting to interfaces within IDF2; see network floor diagram for clarification. Last, regarding FD, this will be the only department required to use wired connections.

An IP addressing scheme must be determined and broken out into a minimum of 6 network zones:

- Network Services
- Campus Data
- Campus Voice
- Campus Wireless
- Finance Data
- Finance Voice

Allowing room for growth of additional subnets in the future! This includes assigning IP addresses for the site's network appliances and network services:

- **DHCP.**
- **DNS.**
- **Voice Gateway [VG].**
- **FSP servers.**

Note that there will be one (1) of each of these appliances in each MDF, and they must be L2 adjacent for their clustering to function.

There will be two internet circuits that demarc into each of the MDF's; split for geographical redundancy. Connectivity must be established to **both** these circuits so that each is used in regular production AND **redundancy** (failover) must be established if either internet circuit were to go offline.

Internal LAN redundancy must also be considered, providing maximum fault tolerance within the limitations of the building's existing cable runs. Other than a device's point of access to the network, **there should be no single point of failure in the network design.**

Project Liaisons and Contacts

Aston Technologies professional services will be the technical advisors and architect for all wired and wireless LAN services. SIC IT staff will be responsible for supplying any relevant documentation, site network floor plan provided, and answering all questions required by Aston Engineer to facilitate decision making and design.

Project Parameters and Limitations

The new SIC Headquarters office is a **pre-existing building with cabling already run from the closets** to workstations, etc.; cabling from patch panels to network racks is not included. **SIC will not be adding additional cable runs between the existing network closets.** Additionally, Aston Technologies agrees to use only Cisco appliances in the wired LAN topology to accommodate the limitations of SIC IT staff's current knowledge.

Budget

For the scope of this project SIC has approved the usage of **\$250,000** to complete this project; this does not include already purchased hours from Aston Technologies for Professional Services. The scope of these funds is to be used for anything that is included in the BoM. Any funds required over the top of what is listed here must be approved by SIC before being submitted for purchase.

Project Scope and Deliverables

Aston Technologies will follow a three (3) phased approach to complete the deliverables necessary for this project. Below the different phases and deliverables that are required to complete each phase are outlined. Additionally, individual roles are listed in the bullets below.

Phase 1: Complete BoM and HLD – Focus: Wired LAN

- Aston Engineer will provide an HLD detailing cabling requirements and how generally everything will connect over **Layer 1**.
 - **Aston Engineer** will create this diagram within the constraints of the Network Floor Diagram.
 - SIC engineer will supply the Network Floor Diagram to Aston Engineer
 - SIC engineer will be configuring all network service appliances and their clustering. (DHCP, DNS, VG), **Aston Engineer to supply 3 IPs for each (1 for each physical appliance in each MDF and 1 VIP to float between them.**
 - SIC will be configuring the FSP, **Aston Engineer must work with SIC Engineer to go over requirements for connecting this FSP to the new network.**
 - **Aston Engineer** will be able to speak to the general strategy of how they will meet the below requirements:

- How is the high-level traffic flow going to work (Campus Data & Voice, and FD Data & Voice)?
- How will network services be reached (DHCP, DNS, VG)?
- Where will the internet circuits connect? How are they being utilized? Failover?
- What technologies are leveraged to ensure FD (IDF2) is sequestered from the rest of the campus?
- General redundancy, what considerations have been made?
- How large a subnet is required to create a valid IP scheme? [not the exact scheme, just a ball park idea]
- Aston Engineer will provide a BoM to SIC that meets these requirements:
 - **Aston Engineer** will use [Insight](#) and [Ebay](#) as preferred vendors when purchasing equipment.
 - All hardware required to build designed network (Switches, Routers, Patch Cables, Transceivers, WLC's, AP's, etc.) will be included in the BoM.
 - Aston Engineer will add additional small components to the BoM to act as spares.
 - Hardware that exists outside of an MDF or IDF is outside of the scope of this BoM [except wireless access points, which must be deployed external to the closets].
 - SIC will supply all appliances not directly related to network, i.e. DHCP, DNS, VG, and FSP servers.

Phase 2: Complete LLD, present Wireless LAN Design, start to lab out design [if haven't already!]

- Aston Engineer will provide an LLD detailing how everything will connect through L3 and describing specific features/technologies running on devices. This design must include details on how everything in the network will be able to communicate with each other.
 - **Aston Engineer** will make all design recommendations for network appliances including how VOIP and Network services (DHCP, DNS, VG, etc.) will flow, and can defend/justify these choices/decisions.
 - SIC engineers have provided the 10.0.0.0/8 network to be used by the Aston Engineer for the campus IP scheme.

- Aston Engineer must create at minimum 6 network zones (Network Services, Campus Data, Campus Voice, Wireless, Finance Data, Finance Voice).
- **Aston Engineer will make code level recommendations for all network appliances included in the BoM.**
- **Aston Engineer** will build into the design the necessary requirements to facilitate connectivity for all network services (DHCP, DNS, VG)
 - Must define interfaces which these appliances will connect to (2 appliances for each service)
 - **Each network service requires 3 IPs**; 1 for each physical appliance in each MDF and 1 VIP to float between them. The appliances must be L2 adjacent.
- **Aston Engineer** will provide a complete solution for segregating the FD from the network utilizing the FSP. **All connectivity considerations for the FSP must be detailed.**
- Aston Engineer will provide complete solution for redundancy within the network, this includes redundancy for the internet circuits as well!
 - SIC engineer will be the middleman between Aston and the ISPs and can provide IP information about the internet circuits.
- Aston Engineer will defend his decisions in full detail in a meeting with the SIC staff to obtain approval of the design, requirements as follows:
 - Explain traffic flow entirely through the network (L1, L2, L3, Etc).
 - Explain in detail how network services will be accessed.
 - Explain in detail how internet circuits will connect and their redundancy.
 - **Explain in detail how the FD is segregated from the rest of the campus and how FD communications will flow through the network: FD-to-FSP-to-services-and-back! FD-to-FSP-to-ISP-and-back!**
 - Explain in detail how redundancy is achieved through the solution(s) they are providing.
 - Explain in detail how the IP scheme will work, why they chose the subnets they did, and a plan on how future subnets should be added.
- Aston Engineer will build a working topology based on their network design. This will be used by Aston management to **confirm** all details presented to SIC stakeholders. [Note: This will not be role played. This is a critical deliverable **for the Mentors/Escalations!**]

- Aston Engineer will design, incorporate, and implement the Wireless LAN.
 - This will require presentation of an LLD describing how wireless will be deployed on top of the Wired LAN.
 - FD will be restricted to the Wired LAN at this time due to security concerns.
 - Upon approval, Aston Engineer will deploy the Wireless LAN as part of the Phase 3 build of the SeaIce Network.

Phase 3: Wired & Wireless LAN deployment plan, verifications, and troubleshooting [MOP].

- Aston Engineer will complete their lab build-out design following approval.
 - Aston Engineer will have physical access to the devices during this time.
 - Aston Engineer will validate all features and technologies described in design phase.
- Aston Engineer will troubleshoot any problems that arise during the deployment process; all work must be completed before SeaIce is set to occupy their new HQ.
 - Any changes that must be made to the LLD as a result of troubleshooting should be well documented and submitted to SIC staff.
- Aston Engineer will create a MOP which could be used to replicate the successful build of the network, as well as offer insight to troubleshooting future network issues.
 - MOP will include configuration scripts for every device in the network.
 - Aston management must approve the MOP.
 - The MOP will have included Implementation and Testing plans.
 - Aston engineer must generate a testing plan which can verify every feature they choose to include in their final design.
 - Aston Engineer must generate troubleshooting processes, using protocol specific methods when appropriate, in the event that issues arise.

Expected Timeframes for Project Completion

SIC anticipates the time to complete this project should not exceed three (3) weeks. Aston Technologies agrees to do everything in their power to meet the timelines outlined below.

Project Phases	Due Date
Phase 1: Complete BoM and HLD – Wired LAN	5/30/2023
Phase 2: Complete LLD & Working Lab – Wired LAN	6/6/2023
Phase 3: Wired LAN build, Wireless Implementation, and MOP generation.	6/13/2022

Next Steps

Upon completion Aston Technologies will hand off all documents created during the design and implementation process over to SIC staff to keep for their own records. Aston Technologies will remain available for day one support at which point the project will be considered completed.