

Advance Network Retainer Professional Service Description

Network Assessment

1. Description of Services.

1.1. **Network Assessment.** Verizon will perform Network Assessment services for the Customer Network, as defined below. "Network Assessment" as used herein means that Verizon will perform a network health and readiness assessment in which Verizon will provide a proactive analysis of Customer's existing network infrastructure. During the Engagement initiation phase, Verizon will work with Customer, including Customer's organizational sponsors, technical points of contact ("POC"), and project managers, to start up the Engagement, collect information and documentation from Customer about the network and set up the network data collection using tools provided by Verizon and/or Customer. Verizon will collect utilization data from network devices (routers and/or switches) via Simple Network Protocol ("SNMP") to capture average central processing unit ("CPU") load; peak CPU load; percent memory used; interfaces percent utilization; and errors and discards. Verizon will collect real-time network and application performance data and traffic pattern utilization statistics on network devices and links enabled to provide the flow data. Verizon may also collect network device configurations as part of the discovery and analysis. Verizon will analyze the network data obtained from the requests for information and the tools based data collection. Verizon will prepare and submit a written findings and recommendations report (the "Network Assessment Report", or "Report"). Verizon will conduct a final presentation with Customer to review the Report and close the Network Assessment.

2. Locations for Analysis of Customer Network

Network Assessments locations are shown in the Engagement letter. The number of Customer Sites for an Engagement is limited as follows:

- Up to two datacenters
- Up to fifteen (15) representative business locations.

3. Scope.

Verizon will perform the Engagement activities listed in this section and these activities are "in scope" for the Network Assessment. Any items or actions not specifically identified in this section are out of scope.

3.1. Phase 1: Engagement Initiation.

3.1.1. Conduct an Engagement kickoff meeting.

3.1.2. Work with Customer to establish a preliminary project plan for the Engagement, and provide a work breakdown structure that outlines the work effort required for the Network Assessment, (the "Engagement Project Plan").

3.1.3. Capture and verify, with Customer's key stakeholders, the business and technical objectives for the Engagement (the "Objectives").

3.1.4. Develop and document an Engagement objective summary statement (the "Objective Summary").

- Develop a requirements summary table with Customer's current requirements for network latency, throughput, uptime, and availability.
- Summarize and review with Customer, Verizon's understanding of Customer stated issues to include the current network environment state, user experience, user workflows, and existing gaps.

3.1.5. Verizon will request and gather current from Customer, as available, network diagrams, network architecture and design documentation, quality of service ("QoS") and other network technical documentation.

3.1.6. Any additional Customer site specific network parameters to provide Verizon background information about the Customer Network at Customer Sites and the network devices located at such sites.

3.1.7. Prepare for tools-based data collection:

- Work with Customer to map out the on premise or remote tools deployment approach.

- Work with Customer to confirm SNMP community string(s) and list of device Internet Protocol (“IP”) addresses.
 - Set up and configure the network data collection and simulation tools.
 - Add devices to the network data collection tools for SNMP discovery and data collection.
 - Work with Customer to identify devices for flow data collection.
 - Work with Customer to prepare devices for flow data collection. Assist with defining flow commands and configurations.
 - Add devices to the Verizon network data collection tools for flow data collection.
 - Provide an initial list of discovered devices (from a representative set of locations) and review with Customer and to verify the tools set up and configuration, (the “Discovered Devices”).
- 3.1.8. Additional data collection may include, as applicable, using Customer tools already in place in Customer’s network infrastructure and data already collected by Customer.

3.2. Phase 2: Discovery.

- 3.2.1. Collect and discover current Customer Network information from network data collection tools. Verizon will capture and measure application traffic utilizing the data collection tools to gain an understanding of traffic flow and application network resource utilization.
- 3.2.2. Collect and document SNMP device inventory data, for network devices instrumented in the network data collection tools for network analysis (collectively, the “SNMP Inventory”) (the individual network device must be properly configured and discoverable via SNMP), such as:
- Device name
 - IP address
 - Location / site name
 - Device type
 - Device vendor / manufacturer
 - Device type / model
 - Operating system (“OS”) version
 - OS release
 - Boot file name
 - Serial number
 - SNMP version
 - SNMP community string
- 3.2.3. Collect utilization data from SNMP enabled network devices to capture:
- Average CPU load
 - Peak CPU load
 - Percent memory used
 - Interfaces percent utilization
 - Buffer errors and discards
 - Input and output queue drops
- 3.2.4. Network Performance Discovery. Utilize network data collection tools to capture key data flows and current network performance.
- Collect real-time sample, over a period of at least two weeks, of capacity/bandwidth and traffic pattern utilization statistics on data network routers, switches and links for critical application data flows.
- 3.2.5. Capture current network QoS design and configuration. Obtain “Show-Tech” reports from in-scope network routers in order to ascertain current configurations and policy mapping.
- 3.2.6. Conduct a check point meeting the Customer stakeholders to review any initial findings from the network discovery, discovery artifacts (Excel worksheets and / or Visio diagrams) and discuss next steps for the Assessment and Analysis Phase.

3.3. Phase 3: Assessment and Analysis.

3.3.1. Analyze the real-time capacity/bandwidth and traffic pattern utilization statistics on data network routers, switches and links. Measure the following parameters to determine whether the current status is good, acceptable, or poor for the following parameters; average CPU utilization (%), average memory utilization (%), input queue drops (%), output queue drops (%), buffer errors, and cyclical redundancy check ("CRC") errors (%).

3.3.2. Analyze network data obtained data discovery, audits and tools.

- Wide area network traffic analysis:
 - Capture the top applications and protocols consuming the most bandwidth over the data collection period(s).
 - Top endpoints.
- Review bandwidth and traffic for cloud, Internet, and external network connections.
- QoS levels of traffic classification in use. Percentage of traffic being assigned to the different queue levels.

3.3.3. Evaluate the network architecture and design:

- Logical Design – Layer 2/3 network structure for virtual local area network ("VLAN"), IP addressing.
- IP segmentation, routing strategy and protocols
- Identify discovered points of network connection with third parties. Map to known connections and document if any unknown connections were discovered.
- Evaluate the network resiliency, stability, and redundancy.

3.4. Phase 4: Develop the Findings and Report Recommendations.

3.4.1. Document the assessment and analysis findings and recommendations. Prepare a written Network Assessment Report.

3.4.2. Prepare final documentation of network assessment results.

- Recommend network architecture considerations for Customer
- Recommend network changes or remediation.

3.4.3. Document the recommendations for enhancing QoS policy.

3.4.4. Analyze each issue identified associated and rank it related to critical, high, moderate or low risk exposure. Verizon will provide a remediation analysis and recommendation(s) for each issue identified.

3.4.5. Complete and submit the final written Network Assessment Report.

3.4.6. Hold a final presentation with the key stakeholders identified by Customer to review the Report and discuss any next steps.

3.4.7. Close the Engagement.

3.5. Engagement Management.

Verizon will designate an "Engagement Project Manager" who will act as the single point of contact throughout the Engagement. The Engagement Project Manager is also responsible for managing the change control process. Should the Engagement's requirements change during the course of the Engagement, the Engagement Project Manager will ensure that any modifications to the Network Assessment are agreed to and documented in writing.

Customer will appoint a single point of contact that is responsible to; coordinate the Engagement activities, interact with Verizon and ensure timely data flow and exchange of information required for execution of the Engagement within the agreed time frame.

Verizon will work with Customer to schedule a kick-off meeting to initiate the Engagement. Verizon and Customer will collaborate to determine required stakeholders and other attendees, agenda, and meeting location (i.e. on site or virtual). At or before the kick-off meeting, Customer shall provide a list of appropriate contact personnel with contact numbers, and appropriate on-site authorization documentation (where applicable). As an output of the meeting, Verizon will produce an agreed Engagement Project Plan, which specifies resources, dates, times, and locations for the tasks described in the Engagement Project Plan.

All Engagement Management activities and duties will be delivered remotely.

4. **Deliverables.** Deliverables are intended for Customer and Verizon use only. Customer may disclose a Deliverable to a third party pursuant to the Agreement's confidentiality terms. Verizon will produce:

4.1. Engagement Project Plan;

4.2. Objectives;

4.3. Objective Summary;

4.4. Discovered Devices;

4.5. SNMP Inventory; and

4.6. Upon completion of the Network Assessment, Verizon will furnish assessment findings and conclusions in the form of a Network Assessment Report, including actionable recommendations.

4.6.1. The Network Assessment Report will include the following sections:

- Executive Summary: Brief analysis and summary of findings and any actions recommended for remediating issues found.
- Current Network Review: an analysis of the Customer Network, inclusive of diagrams and documentation showing findings, recommendations, and priorities for current environment.
- Summary of Recommendations: a summary of the recommendations from the analysis, inclusive of recommendations and rankings related to critical, high, moderate or low risk exposure, a remediation analysis, and recommendation(s) for each issue identified.

5. **Documentation to be produced by Customer and Customer Obligations.** Delivery of the Network Assessment professional services by Verizon is dependent on Customer's performance of the following:

5.1. Provide the necessary commitment of resources and timely response to requests for information to achieve the completion of the Engagement within the mutually agreed timeframes.

5.2. Actively participate in all Engagement related meetings and discussions and mutually collaborate with the Verizon Engagement Project Manager to resolve issues and changes.

5.3. Provide a network resource with sufficient knowledge of the current network environment with sufficient network infrastructure knowledge to review recommendations and design options with Verizon.

5.4. Provide Verizon read only access for all in scope network devices for the purpose of device configuration file collection, as required. If access is not provided, Customer is responsible for providing device configuration files.

- 5.5. For remote tools implementation and configuration, provide access and connectivity as required by Verizon to allow Verizon to access the Customer's network environment with network data collection tools installed at Verizon's data center.
 - 5.6. For on premise tools implementation and configuration, Customer must provide a virtual server / Virtual Machine ("VM") configured and located to specifications provided by Verizon.
 - 5.7. Ensure that the Customer's networking equipment to be analyzed in the assessment will support the Network Assessment in accordance with the specifications and requirements provided by Verizon.
 - 5.8. Customer is responsible for the implementation of any changes to applications or devices managed by Customer's service providers.
 - 5.9. Provide the assistance as defined under the "Customer Obligations" section of the SOW.
6. **Assumptions.** In addition to (i) the above-stated obligations, policies, and parameters and (ii) the assumptions stated in the Assumptions section of the SOW, the following assumptions and considerations shall apply. Verizon's provision of the Network Assessment is based on the following assumptions. Should any of these assumptions prove to be incorrect or incomplete then Verizon may modify the price, scope of work, or milestones.
- 6.1. Network Assessment will be performed during the hours defined in the Engagement Letter.
 - 6.2. Access to the Customer contacts and resources must be provided by Customer during designated time frames, which will be established during the Engagement kick-off meeting. The failure to provide this timely access could delay completion of the Professional Services.
 - 6.3. Device and network information will need to be verified as part of the Engagement initiation.
 - 6.4. Devices must be configured, as defined by Verizon, to support the Engagement, e.g. devices that cannot support SNMP version two ("v2") or that cannot be enabled to be poll-able and accessible via login in viewer mode will be considered out of scope.
 - 6.5. High level or detailed current or future state network designs are not included in Network Assessment.
 - 6.6. Physical discovery or station reviews for any Customer Sites or offices are not included in Network Assessment.
 - 6.7. Discovery of voice networks, including private branch exchanges ("PBX"), and assessments of the same are not included in Network Assessment.
 - 6.8. Wireless Local Area Network ("WLAN") assessment or discovery is not included in Network Assessment.
 - 6.9. QoS application policy requirements gathering, application mapping, design or development of QoS policy, markings, or classes. Identification or documentation of standard QoS design templates for network device types is not included in Network Assessment.
 - 6.10. Asset discovery and documentation of devices other than as provided in Phase 2, Discovery, above, is not included in Network Assessment.
7. **Definitions.** The following definitions apply to Network Assessment, in addition to any other definitions that are available in the Contract or these terms:
- 7.1. **Customer Network:** A mutually agreed list of managed or unmanaged network devices, and the network to which they are connected.