



## 3.0 Network Operations

**3.1** Given a scenario, use the appropriate statistics and sensors to ensure network availability.

- **Performance metrics/sensors**
  - Device/chassis
    - Temperature
  - Central processing unit (CPU) usage
  - Memory
  - Network metrics
    - Bandwidth
    - Latency
    - Jitter
- **SNMP**
  - Traps
  - Object identifiers (OIDs)
  - Management information bases (MIBs)
- **Network device logs**
  - Log reviews
  - Traffic logs
  - Audit logs
  - Syslog
  - Logging levels/severity levels
- **Interface statistics/status**
  - Link state (up/down)
  - Speed/duplex
  - Send/receive traffic
  - Cyclic redundancy checks (CRCs)
  - Protocol packet and byte counts
- **Interface errors or alerts**
  - CRC errors
  - Giants
  - Runts
  - Encapsulation errors
- **Environmental factors and sensors**
  - Temperature
  - Humidity
  - Electrical
  - Flooding
- **Baselines**
- **NetFlow data**
- **Uptime/downtime**

**3.2** Explain the purpose of organizational documents and policies.

- **Plans and procedures**
  - Change management
  - Incident response plan
  - Disaster recovery plan
  - Business continuity plan
  - System life cycle
  - Standard operating procedures
- **Hardening and security policies**
  - Password policy
  - Acceptable use policy
  - Bring your own device (BYOD) policy
  - Remote access policy
- Onboarding and offboarding policy
- Security policy
- Data loss prevention
- **Common documentation**
  - Physical network diagram
    - Floor plan
    - Rack diagram
    - Intermediate distribution frame (IDF)/main distribution frame (MDF) documentation
  - Logical network diagram
  - Wiring diagram
- Site survey report
- Audit and assessment report
- Baseline configurations
- **Common agreements**
  - Non-disclosure agreement (NDA)
  - Service-level agreement (SLA)
  - Memorandum of understanding (MOU)



### 3.3 Explain high availability and disaster recovery concepts and summarize which is the best solution.

- **Load balancing**
- **Multipathing**
- **Network interface card (NIC) teaming**
- **Redundant hardware/clusters**
  - Switches
  - Routers
  - Firewalls
- **Facilities and infrastructure support**
  - Uninterruptible power supply (UPS)
  - Power distribution units (PDUs)
  - Generator
  - HVAC
  - Fire suppression
- **Redundancy and high availability (HA) concepts**
  - Cold site
  - Warm site
  - Hot site
  - Cloud site
  - Active-active vs. active-passive
    - Multiple Internet service providers (ISPs)/diverse paths
  - Virtual Router Redundancy Protocol (VRRP)/First Hop Redundancy Protocol (FHRP)
  - Mean time to repair (MTTR)
  - Mean time between failure (MTBF)
  - Recovery time objective (RTO)
  - Recovery point objective (RPO)
- **Network device backup/restore**
  - State
  - Configuration