The DC-TAC recommends that CENIC provide the following documentation and information to the campuses using the CalREN-DC and CalREN-HPR network regarding the network infrastructure, design, services, practices, and equipment.

The DC-TAC recognizes that the CalREN NOC has already implemented some of these recommendations and is in the process of implementing others.

- **Network Maps**
  - Updated monthly (depending on rate of change TBD)
  - Layer 1 – Fiber routes
  - Layer 2
    - Waves, end to end
    - Ethernet topology
  - Layer 3 – Beyond InterMapper
  - Include “last update” info on all maps
  - Points of demarcation between CENIC and the campus network.
  - Password protected??

- **Performance and Usage**
  - **ISP Drain Usage Reports**
  - Percent availability and reachability of various CENIC-managed network services.
    - Campus access infrastructure (by campus).
    - Campus access infrastructure redundancy (by campus).
    - CalREN backbone nodes (by node).
    - ISP drains (by drain).
    - Scheduled and unplanned downtime.
  - “Average / peak / 95 percentile” utilization of various CENIC-manage network objects (e.g., access links, access routers, gatekeepers, MCUs, etc.) as appropriate.
    - Packets/second
    - Errored seconds
      - Error counts by type (packet loss, CRC, protocol violations, etc.)
    - Octets/second
    - Packet loss
    - Latency
    - Jitter
    - Total throughput of a router (packets switched);
DC-TAC Recommendations
Basic NOC Information Services

- Link latency
  - Archived performance data (i.e., data warehouse)
    - Maintain and provide a central repository of information for customers about the operation and reliability of the CalREN networks.
    - Monthly ISP Usage Reports
    - Monthly NOC Reports

- NOC
  - Trouble Ticket Activity Reporting
    - Weekly summary of new tickets opened.
    - A list of open problems (weekly) indicating the current stage of problem resolution, the severity/priority, and the time ticket has been open.
    - A list of tickets closed with a brief summary of their cause(s) and ultimate resolution.
    - An aging report of tickets showing any escalation action
    - Percentage of sites/users affected by an incident (e.g., out of service).
    - Percent of sites without a trouble call during reporting period.
  - Trouble Ticket Response Time Reporting
    - Expected call time experience by callers before speaking to a human and percent of calls achieving this objective.
    - Expected resolution time for various classifications of trouble tickets and the percent achieving this objective.
    - Percent of trouble tickets handled according to published escalation procedures for:
      - Communicating trouble ticket numbers,
      - Status of trouble tickets, and
      - Response to tickets.

- Change Management
  - Appropriate campus notification and documentation of any CENIC-performed installation, adds, moves, or changes as defined in the NOC RFP or recommended by the DC and HPR TACs

- Communication Methods
  - Ops-announce list
  - Ops-problem-detail list
  - Recorded phone message
  - Broadcast FAX to customer NOCs.
  - Mechanism to allow customers to obtain detailed status on tickets they have submitted.
  - E-mail notification to submitting customer when activity is logged against his or her trouble ticket.
  - Web