NHDC - North Hall Data Center Infrastructure - Service Level Agreement

The purpose of this Service Level Agreement (SLA) is to define the availability and response times for the infrastructure services offered by NHDC, service limitations and customer expectations and interactions.

This SLA incorporates several documents published on the OIST NHDC web site at http://www.oist.ucsb.edu/services/north-hall-data-center, most notably the *Service Description* and *Data Center Access, Etiquette and Safety* documents. Where a specific provision of these documents conflicts with this SLA, the SLA terms and conditions prevail. This SLA is executed by the customer and NHDC Management upon the hosting of the customer's equipment at NHDC.

NHDC is a shared UCSB resource whose service and scope are determined by the UCSB NHDC Executive Governance & Steering Committee. OIST has been charged with managing the NHDC for the benefit of the entire UCSB community.

The NHDC service offering is designed for remote administration of systems hosted within the NHDC. Access on a routine or recurring basis when not engaged in repair type activities is not part of the service offering. Standard Access to the NHDC is M-F, 8-5 during staffed hours, excepting University holidays. Customers will be granted escorted access upon identification by NHDC staff. NHDC is unattended outside of these hours. Customers may request exception to Standard Access. Such requests are reviewed on a case-by-case basis, are subject to an additional agreement with NHDC, and will only be granted based on an exceptional need that is subject to periodic review. Please see the *Data Center Access, Etiquette and Safety* document for additional information.

1. Document Control

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3. Support Hours

Background: The design of NHDC called for a largely unattended facility. The physical plant is designed to function on 100% automation. Equipment hosted in NHDC was envisioned to be enterprise grade, where critical equipment would include redundancy to accommodate a routine failure (hard disk, power supply, redundant server), and that remote administration techniques would be utilized by hosting tenants. Effectively IT engineering would replace the need for onsite operations staff. As of FY 2012/13 NHDC has one FTE formally assigned.

NHDC support staff will be available for service during the following hours:

Classification	Hours of Service
Normal Business Hours (Bus Hrs)	Monday through Friday 0800-1700 PT, not incl. Campus Holidays
Emergency On-Call Services	Monday - Friday 0700-0800,1701-2100, not incl. Campus Holidays Saturday - Sunday 0800-2100, not incl. Winter Holidays
No On-Call Services	Monday – Sunday 2101 to 0700, Campus and Winter Holidays *IT management remains on-call for notification of production failure or other disasters that might interfere with critical campus services.*
Physical Plant Maintenance	Facility infrastructure may be taken off line from time to time for regular maintenance as published on the NHDC calendar posted on the web site. Maintenance deemed to have potential impact on hosting customers will also be announced to via the appropriate NHDC mailing list.
Network Plant Maintenance	Planned disruptive network maintenance may be scheduled between 5:00-7:00am on the second Tuesday of each month. Notification will be provided to affected customers at least two weeks prior to any scheduled maintenance.

4. General

Acceptable Use

Customers of the NHDC are UCSB organizations, their employees and students. NHDC Executive Governance must explicitly sanction all other forms of use.

Audit

NHDC is subject to UC and UCSB policy. From time to time, Audit Services or an external auditor may evaluate the NHDC and/or its contents. NHDC management is not responsible for any IT related findings other than the physical security of the NHDC facility. Customers are responsible for all other IT related findings specific to their equipment or software running therein.

Health and Safety

NHDC is subject to and adheres to UCSB campus Environmental Health and Safety (EH&S) standards. NHDC customers are responsible for, and must promptly remedy, any EH&S finding related specifically to the equipment the customer has placed within NHDC.

Liability and Insurance

Neither NHDC management nor OIST assume any liability for, nor provides insurance for, any equipment placed within the facility.

Policy

The Infrastructure Services described in this document are all within the context of the North Hall Data Center (NHDC) policies and processes as published on the OIST web site, and may not be interpreted in any other context. This document does not supersede, modify or replace any other published policies or practices associated with UC or UCSB information technology. Statements made herein are only within the context of the NHDC service. Anything not specifically included herein as part of this service offering is not available.

Presumption of Services

OIST commits to customers of the NHDC that they will receive the services described by this document. The NHDC SLA is reviewed on a yearly basis for alignment with campus executive plans and objectives and is thus subject to change. Budgetary, organizational or other changes initiated through executive decision making are outside of the purview of OIST. Such changes may result in significant alteration of the NHDC SLA, which will then apply to all customers of NHDC. Acts of God or other events outside of OIST scope may also impact SLA delivery objectives. Examples include but are not limited to: campus closure, extreme weather phenomenon, terrorism, regional grid or other infrastructure failure affecting the UCSB campus.

5. Infrastructure Services

The North Hall Data Center (NHDC) is available for physical colocation of Information Technology (IT) servers, storage, network and related devices. NHDC provides power, cooling, network connectivity and a common physical security model for all UCSB customers choosing to locate their equipment in this space. The baseline service is provided at no charge to customers. The Service Description (SD) located on the OIST web site provides the specific details of the baseline service. NHDC utilities are not fully built out, and are intended to be scaled with the occupancy. NHDC is designed to resemble Tier 1 ANSI/TIA data center standards. In the general case, customers need only supply the IT equipment intended for colocation within NHDC.

The following Service Tables project Availability during normal operations, not unusual (i.e. extended Utility Power Outages such as rolling blackouts) or extraordinary (i.e. Gap Fire) events.

Infrastructure Service Name	Component	Description	Metrics	Target Performance	Availability Period
Staffing	Daily Operation	Ingress and egress for customers and vendors	Staff Present (in hours) Per Month	95%	Bus Hrs
	Intake and Outtake	Appointment for equipment install / deinstall on customer choice of day	Customer First Choice Day Customer Second Choice	80% 90%	Bus Hrs
	Scheduled Off-hours Intake and Outake	Special appointments made with 48 hour notice	On week day of customer choice – 1700-2400 Sat/Sun/Holiday of customer choice	Best Effort Best Effort	5 days/week 7 days/week
	Emergency Off-hours M-F	Invoke NHDC management response	Call return time	2 hours	Annual
	Emergency Off-hours Sat-Sun	Invoke NHDC management response	Call return time	4 hours	Annual
	Consultation	Appointment with NHDC senior IT professional	Week of customer choice	95% of requests	50 weeks – Winter Holidays not included

Infrastructure Service Name	Component	Description	Metrics	Target Performance	Availability Period
Provision Physical Space	Less than 30U of Rack Space	Non-contiguous space for customer equipment	Business Days	Five (5) Business Days	50 weeks – Winter Holidays not included
	38U Rack or multiples thereof	New Purchase to NHDC Standards	NHDC standard rack platform ready to receive customer equipment	8 weeks	50 weeks – Winter Holidays not included
	Non-Conforming Equipment	Customer Equipment not within NHDC stds	n/a	Governance approval and best effort response	Annual
Electrical Power Availability	SCE Utility	Filtered 230V Utility Power at rack PDU	Hours per year	Per Edison Uptime	Annual
	NHDC UPS	UPS/Genset 230V Power at rack PDU	Hours per year	99% except scheduled maintenance	Annual
	Non-Standard Utility or UPS Power Provisioning	Customer Equipment requirement differs from 60A, 230V/Rack	n/a	Governance approval and best effort response	Annual

Infrastructure Service Name	Component	Description	Metrics	Target Performance	Availability Period
HVAC Availability	Main Floor Air Handling	CRAH based Ambient cooling	Hours per year	99.9% except scheduled maintenance	Annual
	Main Floor Chilled Water	CHWS for special cooling technologies	Hours per year	99.9% except scheduled maintenance	Annual
	UPS Room AHU	Cooling for NHDC UPS Systems	Hours per year	99% except scheduled maintenance	Annual
Networking Availability	Top of Rack Switching (TR)	Intrarack and interrack networking	Hours per year, per component	99.9% except scheduled maintenance or Electrical failure	Annual
	Middle of Row (MR) Switching	Aggregation for Top of Rack and uplink to room switch	Hours per year, per component	99.9% except scheduled maintenance or Electrical failure	Annual
	Room (RA) Aggregation Switching	NHDC border to campus backbone	Hours per year, per component	99.9% except scheduled maintenance or Electrical failure	Annual
	Special Uplinks	Networking agreed upon by NHDC and the customer	Hours per year, per component	99.9% except scheduled maintenance or Electrical failure	Annual
Command & Control Signalling	Status signaling for customer monitoring	Pollable SNMP Facility Status	Hours per year, per component	99.9% except scheduled maintenance or Electrical failure	Annual

6. Service Transactions

Requests for the following IT service transactions should be acknowledged and handled within the time given in the table below. Services not listed will be handled according to priority and in accordance with current IT resource availability.

Service Name	Description	Relevant Group	Request Acknowledged	Service Hours Available	Targeted Performance
Provide Customer walk-in access	Access to customer equipment during business hours	NHDC team	interactive	Business Hours	interactive
Provide Emergency Access	Access to customer equipment outside business hours	NHDC team	2 hrs	0700-0800, 1701-2100 @ best effort	3 hours
Respond to Networking Failure	Failure of top off rack or center of row switch	NHDC team	2 hrs	24 hours @ best effort	1 Day
Intake/Outtake	Appointment for customer install or remove of equipment	NHDC team	2 Business Days	Business Hours	5 Business Days

7. Customer Expectations & Interactions

The *Data Center Access, Etiquette & Security* article on the OIST NHDC web site provides additional material on the requirements for Customer's interacting with NHDC. The intent of this section is to provide additional, practical clarification of the various demarcation points.

Shared Racks

1 NHDC will assign equipment location, provide and provision copper network and power cabling to your equipment based on information obtained during the Equipment Intake process.
2 NHDC staff will coordinate logical network addressing and services with the Customer.
3 Customer is responsible for ensuring their equipment meets the minimum NHDC requirements as stated on the NHDC web site.
4 Customer is responsible for the delivery and physical installation of the equipment in the rack.
5 Customer has access to the NHDC Staging Room for equipment build out and repair.
6 Customer may connect and disconnect power and networking cables at their equipment, not at the NHDC provided infrastructure (PDU, Switch).
7 Customer may not interact, in any way, with any equipment not their own.
8 Rack PDU's, network switches, cable routing, and cable trays are NHDC responsibility and are off-limits to the Customer.
9 All Customers in a given rack will be provided the combination to the rack doors, which will remain locked. NHDC also has this combination.
10 Customers have Standard Access to their equipment (Escorted during Business Hours) unless other access has been approved by NHDC Management / Governance, i.e. customer is a Certified NHDC Service Provider.
11 All Customers contacts are automatically subscribed to the NHDC-L email list for facility announcements.
12 Customers may elect to subscribe to the NHDCALERT list for environmental and other operational announcements.
13 Customer is responsible for the physical removal of equipment from racks and NHDC.

Non-Shared Racks

1 NHDC will assign equipment location, and optionally provide and provision copper network and power cabling to your equipment based on information obtained during the Equipment Intake process.
2 Customer is responsible for ensuring their equipment meets the minimum NHDC requirements as stated on the NHDC web site.
3 Customer is responsible for the delivery and physical installation of the equipment in the rack.
4 Customer has access to the NHDC Staging Room for equipment build out and repair.
5 Customer cable management in non-shared racks must conform with NHDC standards in terms of neatness, slack management, and professionalism,i.e. no rat's nest will be permitted.
6 In the case of adjacent racks, Customer may not run inter-rack cabling without express review and approval by NHDC. Inter-rack cabling is to be minimized.
7 NHDC retains management of power distribution within non-shared racks to ensure UPS power management, genset loading in emergency situations and safety. Once a PDU outlet is assigned to specific equipment, customer may not reassign that outlet without pre-coordination with NHDC. Customers should not interact with the rack mounted PDU unless otherwise directed by NHDC.
8 If NHDC top-of-rack networking is present, NHDC retains management of network port assignments within non-shared racks to ensure network efficiency and availability. Once a network port is assigned to specific equipment, customer may not reassign that port without pre-coordination with NHDC. Customers should not interact with the rack mounted NHDC switch unless otherwise directed by NHDC.
9 If NHDC top-of-rack switching is not present,i.e. customer is providing their own network infrastructure, customer has full authority to manage port assignments, cable connections, etc. between customer's equipment. Connection to NHDC's uplink switch / network service remains the purvue of NHDC.
10 Customer will be provided combination for non-shared rack doors, which will remain locked. NHDC also has this combination.
11 Customers have Standard Access to their equipment (Escorted during Business Hours) unless other access has been approved by NHDC Management / Governance, i.e. customer is a Certified NHDC Service Provider.
12 All Customers contacts are automatically subscribed to the NHDC-L email list for facility announcements.

13 Customers may elect to subscribe to the NHDCALERT email list for environmental and other operational announcements.
14 Customer is responsible for the physical removal of equipment from racks and NHDC

8. Limitations on Service Offering

Customers are encouraged to review the *Use Cases and Limitations FAQ* on the OIST NHDC web site to better understand NHDC's capabilities in various Use Cases,i.e. Utility Power Failure, HVAC Failure, etc.

1 Available UPS power limited to that provided by NHDC infrastructure.
2 Customer-provided UPS systems are not permitted.
3 Available Cooling is limited to that provided by the ambient cooling infrastructure. NHDC has back-of-rack cooling standards, but that service is not part of the standard service offering.
4 Customer-provided Networking Equipment is the responsibility of the customer. NHDC support extends only to the top of rack demarcation port and cable.
5 Network Services or Protocol support is limited to those defined within NHDC networking standards.
6 Firewall, intrusion detection or other higher layer networking services are Customer's responsibility.
7 Network, storage or software design services are Customer's responsibility.
8 Operating system or application software support are Customer's responsibility.
9 Monitoring of Customer servers / applications are Customer's responsibility.
10 Disaster Recovery (DR) or Business Continuity Planning (BCP) services are Customer's responsibility.
11 Relocation planning or budgetary responsibility for the movement of customer equipment is Customer's responsibility.
12 Removal of equipment packing materials is Customer's Responsibility.
13 NHDC does not provide "Remote hands" services by operational or professional staff.
14 NHDC does not provide computing equipment warranty, service, support or insurance.
15 NHDC does not provide service level consultation or design.
16 NHDC does not provide project management of equipment or service cut-overs.
17 NHDC does not provide network performance guarantees.
18 NHDC does not provide storage space for any customer spare equipment or tools.

9. Reporting

Quarterly reports of NHDC events and performance will be distributed to interested parties list and posted on the OIST web site. Reports will include significant unusual events and outcomes, all requests to, and responses from, Executive Governance, off-hours access reports, and quarterly financial information.

10. Service Suggestions, Changes & Review

Suggestions for enhancements to service levels, service description or comments on any aspect of NHDC Operations may be presented to NHDC Management. Requests outside reasonable determination by NHDC Management will be forwarded to the NHDC Governance and Steering Committee for review.

These requests, and Committee responses, will be made public on the NHDC www site. Communications to the Committee should be written in memo format, and may be presented to NHDC Management via email to NHDC@OIST.UCSB.EDU, in person at NHDC or the OIST Computing Infrastructure Customer Counter in 4101 SAASB.

11. Approval & Signature

Customer acknowledges they have read, understand and agree to abide by the NHDC Service Level Agreement / Service Description and supporting documents. Failure of customer, or customer designees, to adhere to NHDC policy and procedure may result in loss of access to hosting in the NHDC.

Customer further understands and agrees that the NHDC Executive Governance & Steering Committee will periodically review NHDC operations and may choose to modify the Service Level Agreement / Service Description, which will then apply to all customers of NHDC equally.

By signing below, representatives from OIST and UCSB NHDC colocation customer acknowledge their approval of the terms of this document.

OIST:	
Name:	

Signature:_____ **Date:**_____

Customer:	
Name:	
Title:	

Signature:_____ **Date:**_____

Appendix A: Metrics, Terms and Descriptions

Name	Description
Availability Period	Time frame in which the Service is intended to be offered and therefore the metric for availability. May be measured by hour, day, week.
Best Effort	Times when NHDC does not have SLA defined coverage, but through the professionalism of the NHDC Team will make “Best Efforts” to meet your needs.
Business Days	Regular UCSB Business Days which exclude campus holidays or other campus closures.
Business Hours	Monday - Friday 8am to 5pm on UCSB Campus Business days.
CHWS	Chilled Water System
CRAH	Computer Room Air Handler
Emergency Access	Request for access by a colocation customer during non-business hours in response to an outage affecting a departmental or campus-wide mission-critical service.
Hours per year	Metric for Availability for the entire Service, where the failure of a component *does not affect* the Service Availability from a Customer perspective. Example: the ambient cooling system is served by 5 CRAH units. A failure of one does not affect the Service Availability from a Customer perspective.
Hours per year, per component	Metric for Availability for a component of a Service where the failure of a component *does affect* the Service Availability from a Customer Perspective. Example: the network service is dependent on top of rack and row aggregation switches. A failure of one of these components affects the Service Availability from a Customer perspective.
NHDC Team	Staff assigned, both formally and informally, to ensuring Service availability.
Scheduled Maintenance	Predetermined, scheduled and announced maintenance period where a Service or component will be offline for maintenance, repair or upgrade. Scheduled Maintenance in not considered downtime in evaluating if a Service is meeting its Target Performance goal.
Standard Access	Escorted access M-F, 8-5 during staffed hours, excepting University holidays.
Target Performance	The portion of the Availability Period that NHDC strives to provide the Service to you. May be measured in hours, days, weeks or as a percentage of the Availability Period. ex. 99.9% Target Performance for a Service with a Annual (one year) Availability Period equals 8.76 hours of downtime per year. Scheduled Maintenance is not considered downtime in the evaluation of meeting Target Performance.
Winter Holidays	Up to two weeks, typically Dec 25 to Jan 2 of each calendar year

Appendix B: Network Services and Standards

Network Services

NHDC provides a standardized networking model as described below, including associated purchase, configuration, installation, operation and maintenance support.

Physical Topology and Specifications

A 10Gb link connects an NHDC border switch to the UCSB campus core. The NHDC border switch provides 10Gb links to a middle-of-row (MR) switch in each row. The MR provides a 10Gb link to each top-of-rack (TR) switch. The TR switches provide 48 ports of 1Gb TX. The entire network is managed via an independent, out-of-band network.

Four rack-unit (RU) spaces are reserved in each standard cabinet for TR switches. An additional eight RU are reserved at MR switch locations.

Inter-rack cabling meets the following requirements:

- OM3 or better multi-mode, aqua jacket, 2mm preferred
- OS1 or better single-mode, yellow jacket, 2mm preferred
- Cat5E or better copper
    - Blue jacket for NHDC out-of-band management
    - Grey jacket for customer networking

All cabling must be secured through the use of Velcro-style wraps. Zip ties are not permitted in any cable management application. Cables should be of the proper length to permit proper routing with minimal slack. Any slack should be placed as close as possible to the end device, avoiding congestion problems associated with consolidation of excess cabling. Cabling must follow established pathways, both intra- and inter-cabinet and in the overhead cable trays. Cabling must not interfere with future assignment of other rack unit spaces, and should be placed to minimize impacts to proper ventilation.

All external connectivity is via the NHDC network. No other physical transports are permitted in the NHDC, incuding intra-campus fiber.

Cable Labels

All cables must be clearly labeled with a wrap-around style label. Labels must be placed at both ends of each jumper and within 4-6 inches of the connector, with deviations only as minimally necessary to provide ready access to the label while avoiding interference with cable operation. Cables less than 18 inches long may have a single label in the middle of the cable.

Each cable label must display at least two lines indicating both end points of the cable. Each line uses the following format:

rXrYuZ-S
Where X=Row number, Y=Rack number, Z=RU position
S=String of up six characters indicating specific physical port on device
The string must clearly relate to labeling on the racked device.
Default format is “e1”, “e2”, etc., to reference ethernet ports.
If the racked device is a multi-slot unit, “e3.2” could indicate slot 3, port 2.
“mgmt1”, “ilo” or similar designations are used for dedicated management ports.

Logical Topology

The network consists of layer two, switched ethernet. Intra-NHDC links are 802.1Q trunks with jumbo-frame support up to a 9000 MTU. Customer links may be untagged or VLAN tagged. All VLAN numbering must be consistent with allocations by the Network Operations Center.

Loop prevention is provided by a single instance of rapid spanning-tree. The NHDC network is an independent spanning-tree domain, and is not intended to participate in either the campus network spanning-tree domain or any customer spanning-tree domain. For this reason, customer equipment must not send spanning-tree BPDUs into the NHDC network; doing so may result in automatic loss of connectivity until the cessation of BDPU traffic.

Routing and associated access-control list implementation is provided by the campus data network core routers according to the procedures of the Network Operations Center.

Redundancy

The NHDC network has limited redundancy in the initial deployment. Physical links and switches are not redundant, but all customer-transport equipment feature redundant power supplies.

Spares and Disaster Recovery

NHDC maintains at least one spare of each item used in the NHDC network. All switches have a vendor maintenance contract for software updates and hardware support. All configurations are automatically backed up after each change, with additional local and off-site tape backups. University self-insurance may be necessary in the event of a massive equipment failure, such as during a natural disaster.

Monitoring

NHDC network equipment is continuously monitored for proper operation with automatic notification to network staff in the event of failures. Notifications are not generated for customer-facing switch ports, since normal customer operations may result in false positives.

Maintenance Activities

Planned disruptive network maintenance may be scheduled between 5:00-7:00am on the second Tuesday of each month. Notification will be provided to affected customers at least two weeks prior to any scheduled maintenance.

Unplanned emergency maintenance may occur in response to equipment failures or other issues which present a significant and immediate risk to normal operation of the NHDC network. Advance notice may not be provided under these limited circumstances, but customers will receive notice of the activity no later than the conclusion of any such maintenance.

Alternative Networking

NHDC may permit customer-provided in-rack networking equipment after evaluation on a case-by-case basis. Primary issues evaluated will include potential disruptions to other NHDC users, traffic patterns and link utilization, and associated inter-rack cabling requirements. Approved deployments will receive connections from MR switches consistent with those using NHDC-provided networking.