

Mission Statement

The 7x24 Exchange Northwest Chapter's mission is to provide an open educational forum dedicated to the continuous improvement and increased awareness of data center reliability by focusing on the key disciplines of design, construction, maintenance, security and management with the goal of obtaining continuous data center operations.

**Symposium: Mission Critical Roundtable
"Meeting the Energy Code in Seattle"**

Date: Thursday, December 3, 2009 3:30 pm to 7:00 pm

Location: **Benaroya Companies**
South Hill Business +
Technology Center

1111 SE 39th Street
Building D
Puyallup, WA
www.benaroya.com

Agenda:

- 3:30 pm Board of Directors Meeting & Open Networking
- 4:00 pm **SigniFire Video Detection System**
- 5:00 pm **South Hill Technology Center Next Generation Data Center Overview**
- 5:45 pm **Data Center Tour**
- 6:15 pm Refreshments
- 7:00 pm Adjourn



Presentations

SigniFire Video Detection System *Fike/axonx LLC*

www.fike.com/products/favideo.html

SigniFire is a turnkey video, flame, smoke and intrusion detection system. The camera based system visually detects the presence of flame or smoke at its source, independent of the airflow in the area. This presentation will provide an overview of this new technology and it's application in data center environments.

South Hill Business + Technology Center Building D Data Center Overview and Tour *Mike Duffy, Duffy Development* *Keith Lane, PE, Lane Coburn Associates*

www.benaroya.com

This new data center was redeveloped from a former semi-conductor manufacturing facility and provides a number of performance and energy efficiency features for data center operations. This presentation will provide an overview of the facility and critical systems, followed by a tour of the data center.

After the tour, attendees are encouraged to enjoy refreshments provide by The Benaroya Companies.

Refer to the attached facility brochure for more information on this data center.

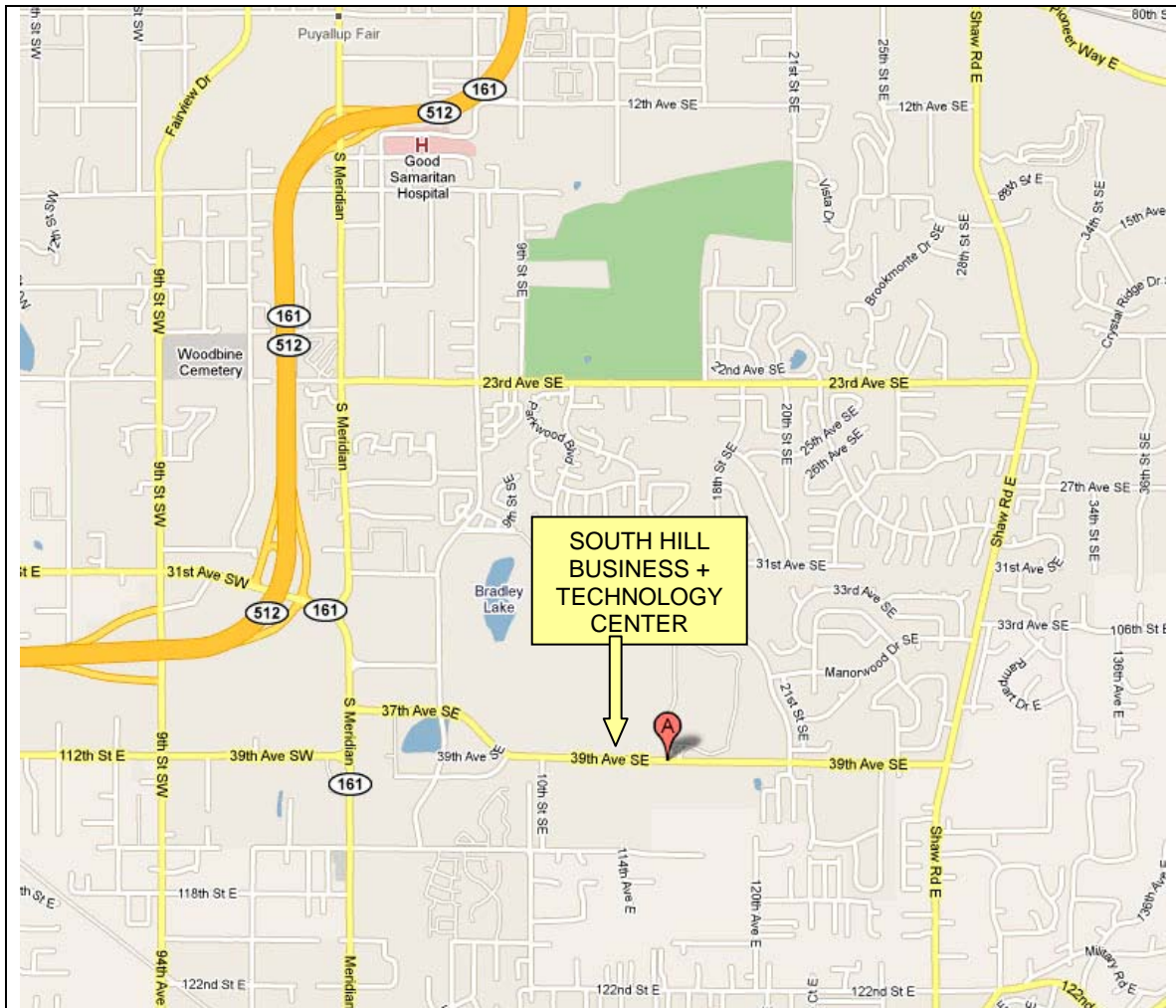
Don't forget to Register On Line: www.7x24nw.org/eventregister.htm

Mission Critical Roundtable

Map and Directions

South Hill Business + Technology Center

1111 SE 39th Street
Puyallup, WA



Directions

From I-5 Northbound:

Take the Highway 512 exit Eastbound
Exit on Highway 161/Meridian Southbound
Turn Left on 37th Avenue SE
37th Avenue SE turns into 39th Avenue SE
Turn Left at the entrance to the South Hill Business + Technology Center
Building D is at the NE corner of the site, parking is on the east side of the building.

From I-5 Southbound:

Take the Highway 18 exit towards Auburn
Take the Highway 167 exit southbound
Exit on Highway 161 southbound
Exit on Highway 161/Meridian Southbound
Turn Left on 37th Avenue SE
37th Avenue SE turns into 39th Avenue SE
Turn Left at the entrance to the South Hill Business + Technology Center
Building D is at the NE corner of the site, parking is on the east side of the building.

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11/20/2009

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December Session Registration

Registering for this Chapter Session is easier than ever! We've now introduced on-line registration on our website. Go to www.7x24nw.org and follow the link from the main page to register. If you want to go directly to the registration page, go to: www.7x24nw.org/eventregister.htm

Membership

The 7x24 Exchange Northwest Chapter encourages membership from all disciplines involved in the design, construction, and operation of critical facilities. Vendors, consultants and users can benefit from the broad range of perspectives and technology awareness our members provide. Our chapter offers two levels of membership, individual and corporate. An individual membership is available for \$50.00 per year and a corporate membership is available for \$200.00 per year. A corporate membership allows you to have as many people in your company be members for one low price.

The easiest way to become a member is to register on line at our website: www.7x24nw.org, look for the Membership page. Fill out the form, click submit, and our membership coordinator will contact you right away. It's that easy!

We invite interested people to attend one session free of charge to see if you like to presentations and the organization. Bring a colleague, a client, or a vendor to the next meeting and introduce them into this dynamic group.

Speaking & Presentation Opportunities

The 7x24 Northwest Chapter is always interested in presentations from end users, consultants, and vendors on new and interesting topics. If you have a topic that you would like to present or if you have a suggestion for a presentation, please contact our Program Chair:

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Program Chair

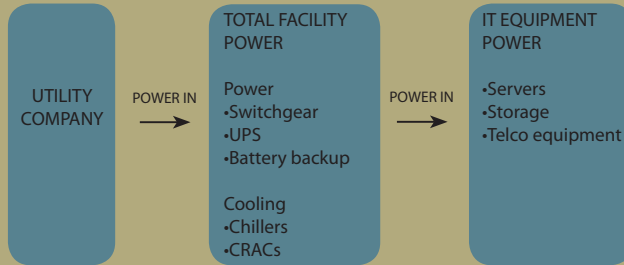
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If you would like to get involved in Chapter activities, just let one of the board members know, we are always looking for more member participation in planning Chapter sessions and communications.

PUE - power usage effectiveness

WHAT IS PUE - Power usage effectiveness (PUE) is a metric used to determine the energy efficiency of a data center. PUE is determined by dividing the amount of power the data center utilizes by the power used to run the computer infrastructure within it. PUE is therefore expressed as a ratio, with overall efficiency improving as the quotient decreases toward 1.

POWER USAGE EFFECTIVENESS



$PUE = \text{Total facility power} + \text{IT equipment power}$

3.0 MW - Conventional Data Center PUE = 1.9 Power Cost - \$0.09/kWh
 3,000 kW @ 1.9 PUE = 5,700 kW @ .95 Load Factor x 24 x 365 =
 47,435,400 kWh @ \$0.09 kWh = \$4,269,186

3.0 MW - South Hill Data Center PUE = 1.4 Power Cost - \$0.058/kWh
 3,000 kW @ 1.4 PUE = 4,200kW @ .95 Load Factor x 24 x 365 =
 34,952,400 kWh @ \$0.058 kWh = \$2,027,239

Annual Sustainable Savings \$2,241,946



Electrical Room



Air Handling Units

Facility Overview

High Capacity Reliability

- 37.5 MW of existing capacity at substation (18.75 MW N+1)
- Supplied by 115kV transmission lines
- Dual fed from separate 230kV sources utility substations
- Complete, redundant system – extremely high power reliability
- 15MVA of transformation in facility (12.47kV/480V)
- Eight 1100kVA Liebert UPS modules in facility

Cooling

- 55 highest quality AHU's (PACE) create ~3 million CFM
- Significant free cooling with air side economizers and evaporative cooling

Connectivity

- Carrier Neutral – Quest and Level 3
- Short distance to Seattle Internet Exchange (SIX) and Pacific Northwest Gigapop (PNWGP) both of which are located in Seattle
- All capable of redundant pathways

LEED Designed

- Efficiently designed to take advantage of the Pacific Northwest's mild air temperature. LEED gold Certification targeted.

Low Cost Power

- Lowest industrial rates in Western Washington
- \$.01 a kW discount from Puget Sound Energy's standard electrical rates
- For a 3MW data center with an average PUE of 1.4 and a load factor of .95, that \$.01 differential equates to savings of \$349,524 /year
- Ultra-effective air side economizers

Water

- Dual fed water line from the City of Tacoma & the City of Puyallup which together can provide up to 2 million gallons per day
- On-site capability to store more than 1.5 million gallons of water

Security

- Highly secure, buffered facility

Data Center Critical Environment Operations

- Scalable on-site critical environment management – aligned with the needs of the user
- On or off-site BMS (building management system) monitoring
- Scalable on-site security staffing

Expansion Potential

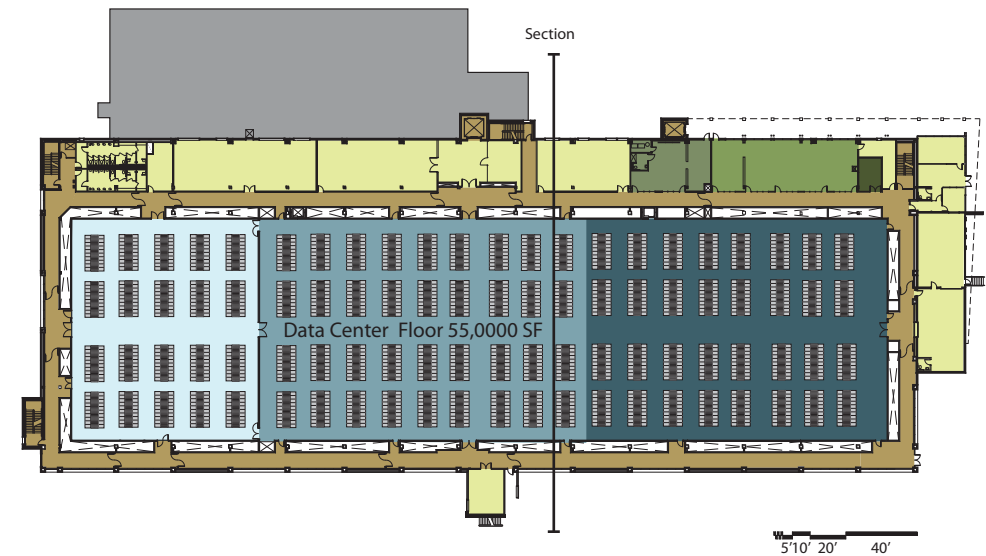
- Yes

Other Benefits

- The City of Puyallup's proactive permitting climate
- Proven data center and real estate team
- Available sites for Data Center Container Deployments as well

Second Floor Plan

- Controls
- Office
- IDF Room
- Data Center Phase I
- Data Center Phase II
- Data Center phase III
- Support
- Circulation
- Return Air



Mechanical System Overview

The mechanical base scope and design will serve up to 55,000 SF of raised floor critical loads. The design and installation will be scalable up to 230W/SF of rack loading and is based upon a fully segregated hot aisle / cold aisle arrangement. The cold aisle is to be maintained at 78° F (max) between 20% and 80% RH (the low and high relative humidity limits are intended to prevent static discharge and condensation respectively). The hot-aisle is designed for a 20-degree F rise across the servers.

The hot-aisle / cold-aisle segregation will optimize the outdoor-air economizing potential. This segregation allows the use of an elevated supply air temperature and as such, direct evaporative cooling and humidification can take care of all of the cooling needs of the raised floor area. This design differs from the conventional method of delivering 50° to 55° F supply-air that mixes with the heat rejected from the server racks. Our design will provide considerable energy savings compared to traditional chilled water system cooling and will offer significant energy savings (up to 75%!) while eliminating the risks of re-start time by not having chillers to re-start.

The AHUs are equipped with a fan section featuring air-foil wheels, evaporative-cooling / humidification, face and by-pass dampers, and a filter section consisting of MERV 8 & MERV 13 filters. The evaporative cooling section will provide the primary cooling and humidification, served by a centralized pumping system (N+1) with evaporative water distribution to the AHUs and drain piping back to a centralized fiberglass tank. A pulsed water treatment (non-chemical) system with conductivity controller and blow-down valve will treat the water.

