USING OPEN SOURCE SOFTWARE IN DAILY ISP OPERATIONS

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v3.0

October 29, 2009

Agenda

- Introduction
- ISP Operational Background
- ISP Operational Challenges
- Open-source Solution Components
- Summary

Introduction

- This presentation reflects the various stages an ISP in Saudi Arabia went through to implement open-source software and tools for enhancing daily operations

- This includes implementing the following:
  - Network graphing tool
  - System and network monitoring
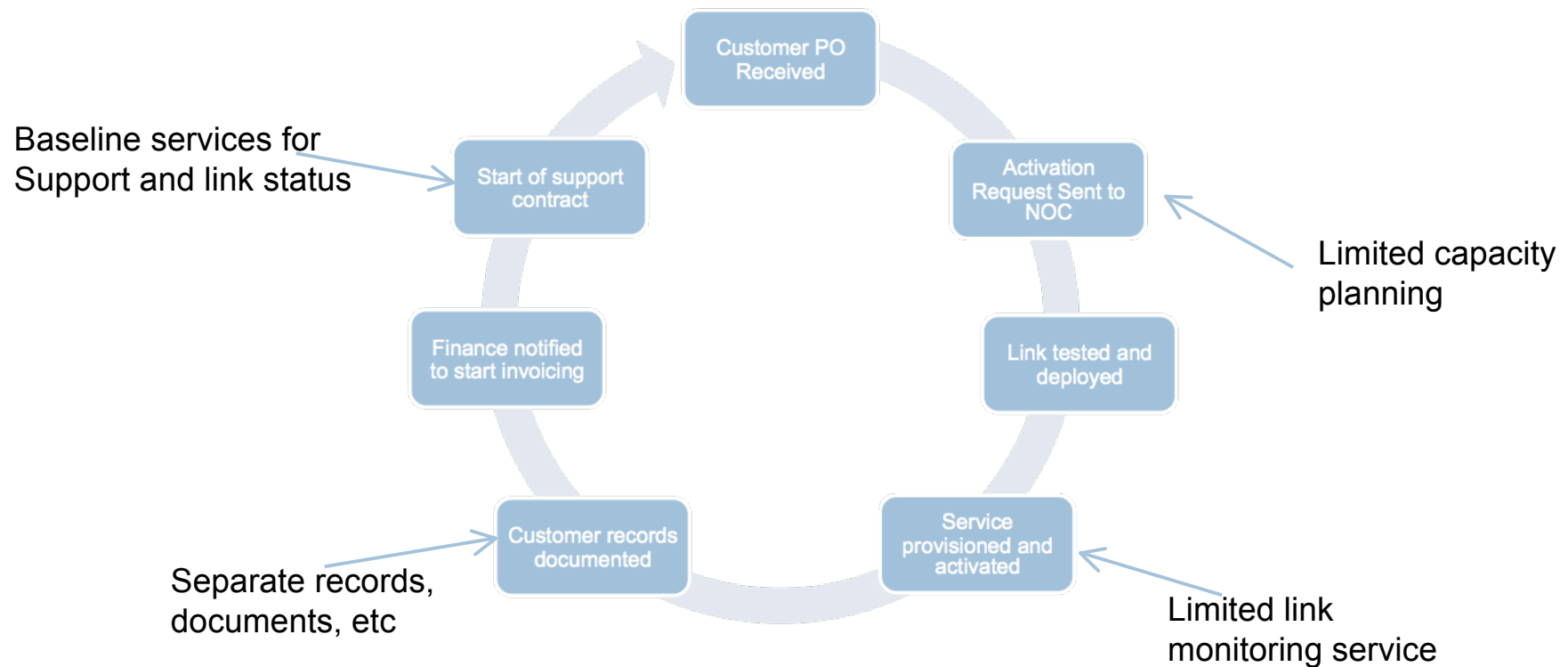 - Customer relationship management

ISP Operational Background

- 5 major POPs in the region
- ATM and IP-based network backbone
- 200+ network devices to manage
- 1000+ customer records
- Various last mile access solutions (Microwave links, digital LL, DSL, WiMax, etc.)
- A plethora of data center systems & applications to manage (web hosting, mail, DNS, LDAP, etc.)
- Multi-tiered support groups

Dhahran

Riyadh

Jeddah

UAE

HQ

POP
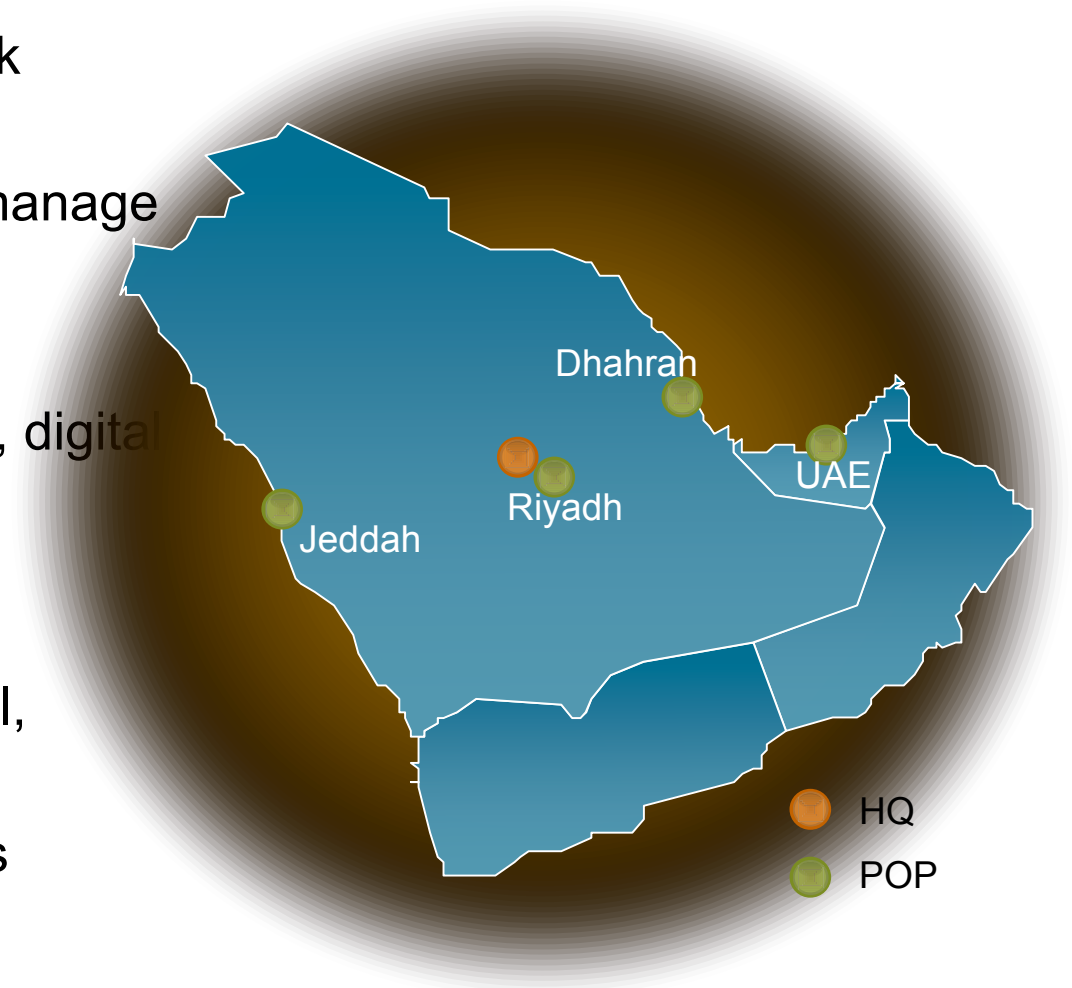
ISP Operational Background

□ **ISP operated based on the following high-level workflow for customer data/internet activation:**

Baseline services for Support and link status

Limited capacity planning

Separate records, documents, etc

Limited link monitoring service

Customer PO Received

Activation Request Sent to NOC

Link tested and deployed

Service provisioned and activated

Customer records documented

Finance notified to start invoicing

Start of support contract

ISP Operational Challenges
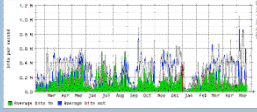
- Main challenges:
  - Limited ability to monitor system and network devices
  - Lack of monitoring, trending, historical graphs, logs, etc.
  - Little visibility into device health check
  - Lack of a central repository for customer records, such as:
    - service dates, activation requests, network diagrams and contact details
- As customer list grows, new tools for network operation & management are needed!
- *Modus Operandi* had to change from fire-fighting to planned service activation and proactive network monitoring and trending

ISP Operational Challenges

☐ Tools used in the past:

Network Graphing	Network Monitoring	Customer Records
-MRTG - Cricket	-WhatsUp - HPOV NNM	-Excel sheets - MS-Word docs -MySQL DB

☐ Drawbacks:

-No roadmap
-Limited SW support
-Complex Scripting
-Bits & pieces solution

-Basic features (WUP)
-Incr. Cost for HPOV
-Infrequent updates

-Manual records
-Chaotic book keeping
-Inconsistent/seldom updated data
-No track of changes

Proposed Solution Components

□ Used alternatives:

Network Graphing	Network Monitoring	Customer Records
Cacti	Nagios	vTiger CRM

Network Graphing: Cacti

- Open-source software for network graphing and monitoring
- Used to monitor traffic, CPU, temperature, etc. – any SNMP-based MIB
- Utilizes RRDTool for fast polling and graphing
- Runs on typical LAMP/WAMP environments
- Web-based administration, access and configuration
- Lively community support
- Multitude of network views, plug-ins, and device templates
- LDAP integration
- Site: http://www.cacti.net
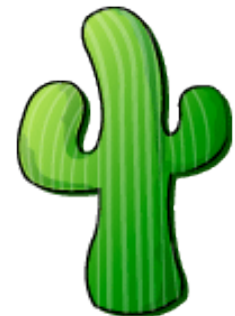
Cacti Implementation

- Cacti was first implemented as a test server to monitor interface traffic on backbone network devices
- Installation was done first on Windows machine (using Cygwin) and moved later on to a Fedora system
- Required the installation of PHP, Apache, MySQL, Net-SNMP and RRDTool
- It was then rolled out to customers to check their link utilization
- More services were later added: weathermap, environmental threshold monitoring, syslog, LDAP integration, etc.
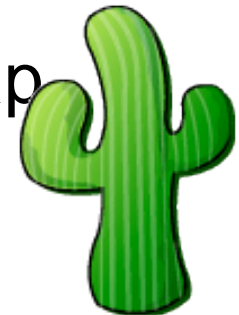
Cacti Features

- Console view: very neat Layout:
  - Many templates available for download
  - Easily add and organize devices, discover interfaces and assign each interface to a customer view
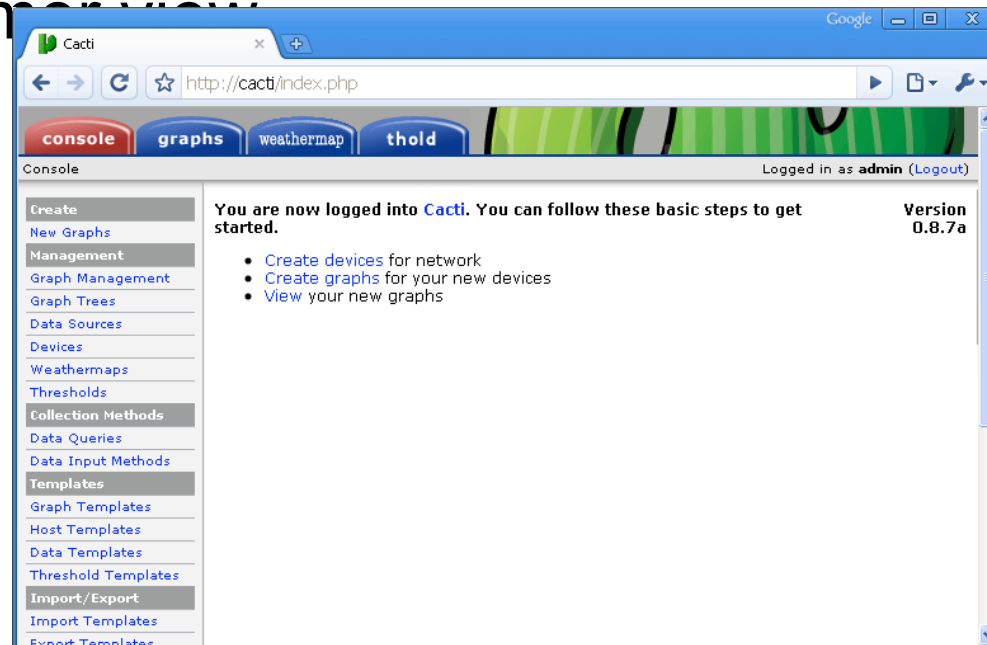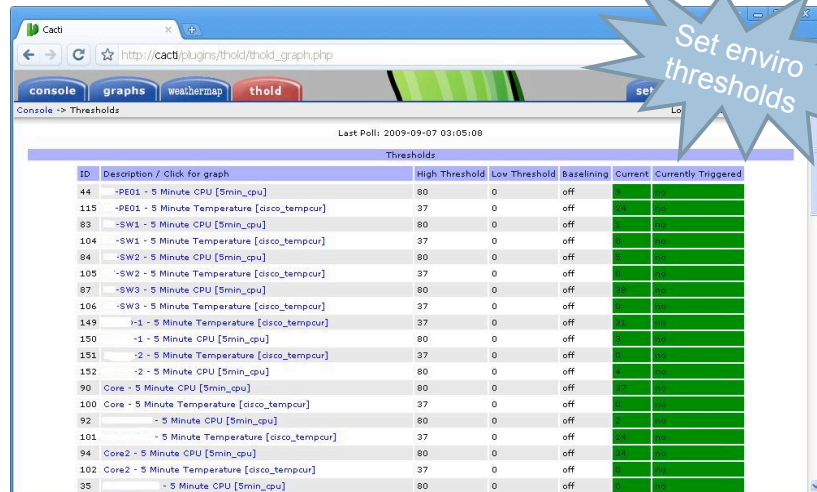
Cacti Features

- Graphical view of collected data:
  - Interfaces, CPU, Temperature, memory, desk space, QoS policies, etc.

Interfaces

Memory

Temperature

CPU
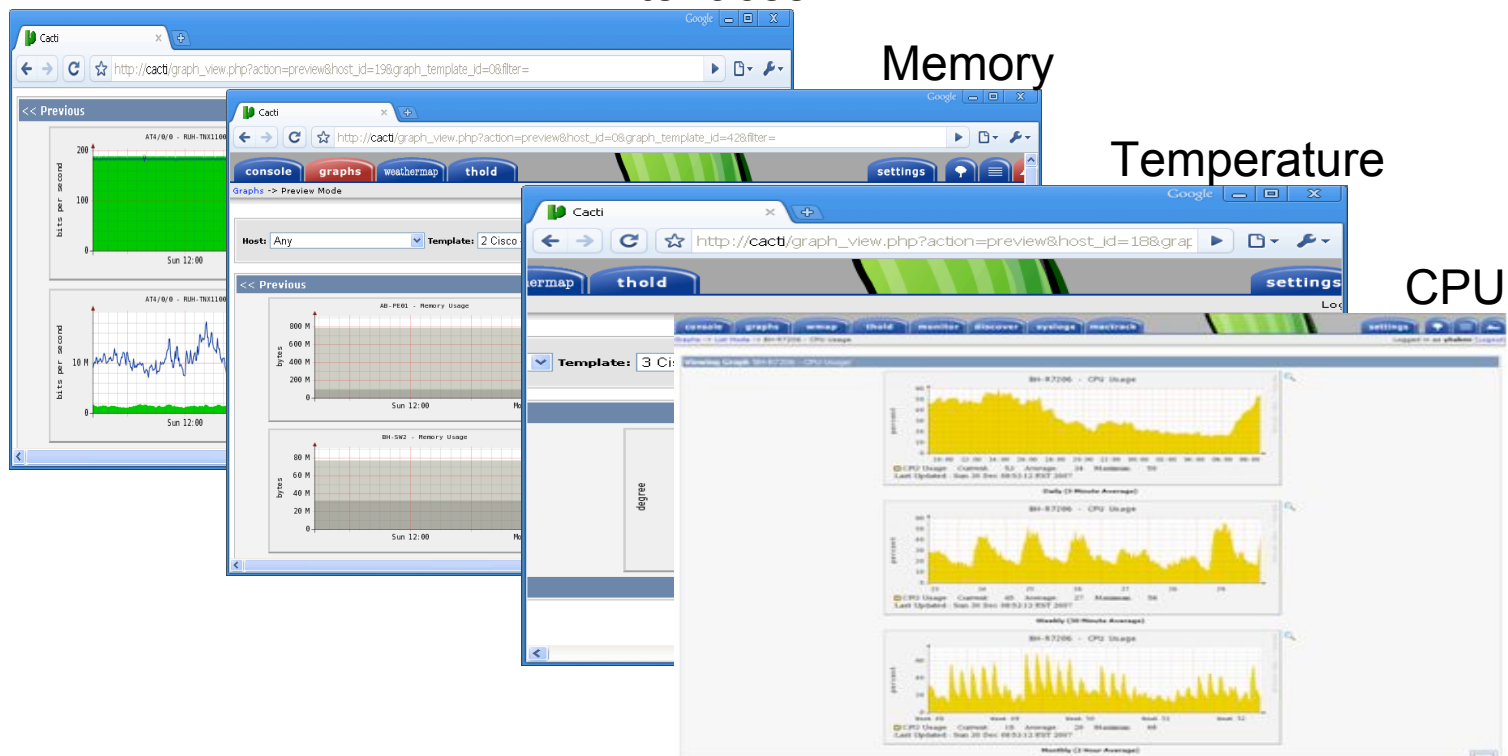
Sample Cacti Integrations

Threshold

Set enviro thresholds

Weathermap
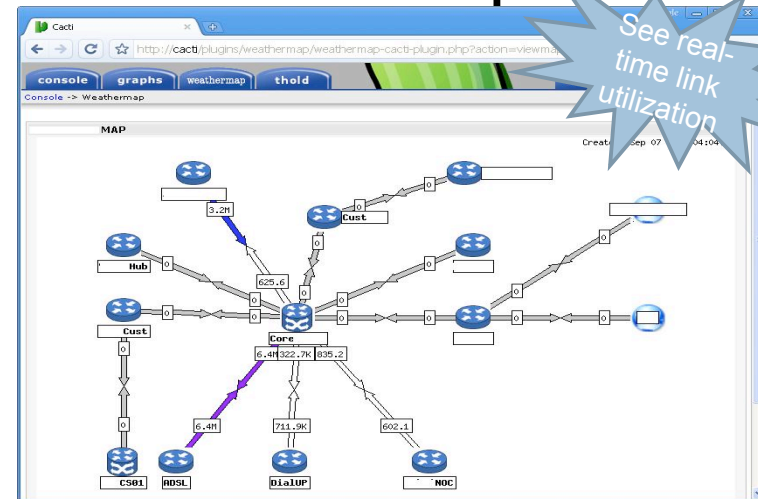
See real-time link utilization

Haloe Syslog

Get traps, logs, per device

Other Notable Integrations :
-Link to SMS gateway for notifications
-Device auto-discovery
-Ntop
-MAC tracking

Cacti Demo

- For a Live CD demo of Cacti implementation, you can try:
  - CactiEZ
  - http://cactiez.cactiusers.org

Network Monitoring - Nagios

- Nagios is one of the most trusted tools for gaining a high-level view on the operation of your system and network devices
- Main features:
  - Monitoring of device availability and associated services
  - Relies on an agent for probing host services
  - Provides detailed reporting and status view
  - Provides trending details
  - Ability to drill-down all the way to a certain service
- Nagios installation is a bit involved – runs on a LAMP environment

Nagios – Map View

□ **Nagios provides a topology view of the devices:**
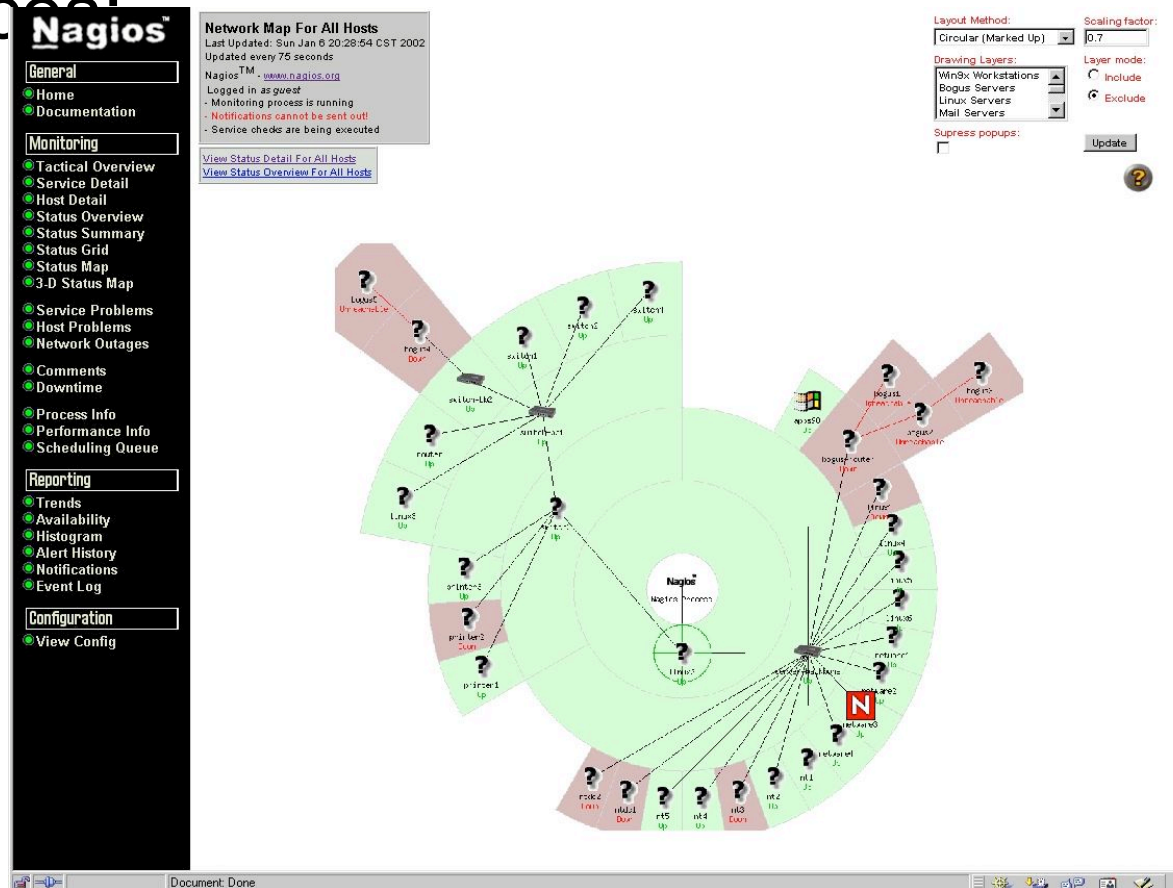
*Simulated

Nagios – Device View

- ☐ Fully customizable with a powerful backend polling tool

- ☐ Provides full details on each device

- ☐ Ability to drill down for service per device

- ☐ Notifications via e-mail and SMS

Nagios Utilization

- Nagios is now used to monitor backbone network devices and plotted on the map view

- Certain servers with running services are also polled from Nagios for availability

- Reporting is introduced to draft histograms of trends and provide a list of critical notifications

- Right now, device settings are stored in a single text file (plan to introduce hierarchy for better scalability)

Nagios - Comparisons

- Nagios is one of many other solutions in the market
- Most notable NMS packages:
    - Zenoss
    - OpenNMS
    - Hyperic
    - GroundWork
- Very robust apps
- Right software is the one that better fits your requirements

Open Source NMS Downloads by Month
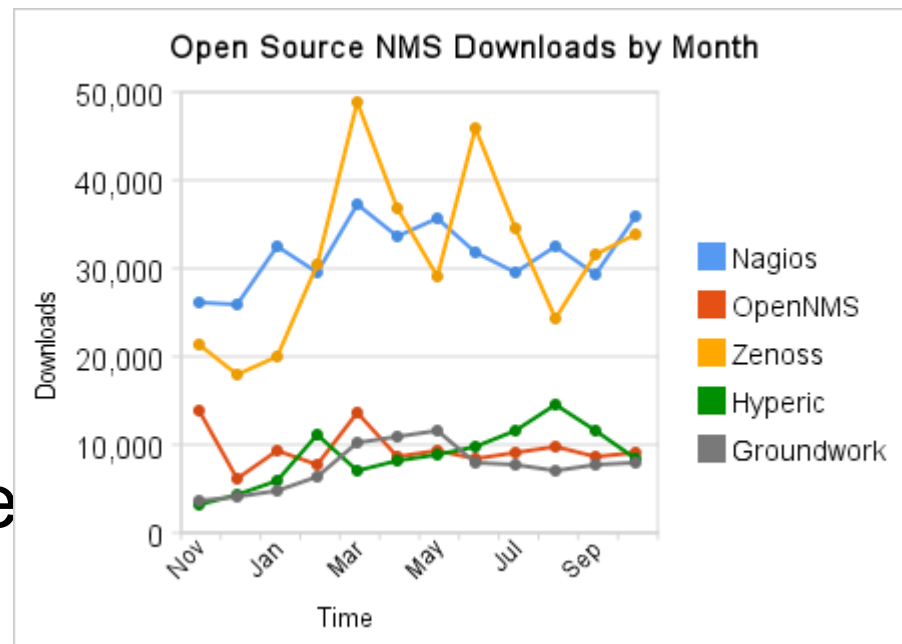
Source: openxtra.co.uk (2007)

Customer Relationship Management

- vTiger is an open-source CRM (http://vtiger.com)
- A fork of SugarCRM
- Runs on a typical LAMP/WAMP environment
- For ISP ops, vTiger provides these features:

  - Customer and link
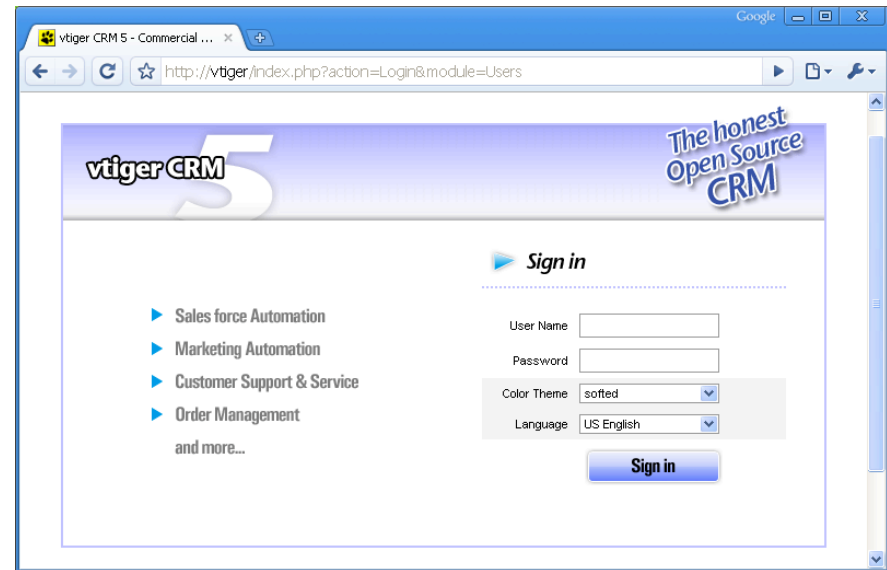
- Activities logs
- Change history

vTiger Benefits

- Central repository for storing customer details
- Customer proposals and contact information from sales is inserted into the system
- Network operation team then utilized this data to initiate deployment cycle
- Once link is activated, network drawings, link details and service start/end dates are populated
- Integrated with LDAP; all record changes are logged

vTiger Interface

Account Name
et number

Account details:
-Contact info
-Creation date
-Account type

Customer info:
-Full account
name
-Provided
services
-Circuit name
and details
-Service start
and end dates

vTiger Interface

Customer Contacts
- Can be imported or exported

Account History
- Trouble tickets
-Activities that took place
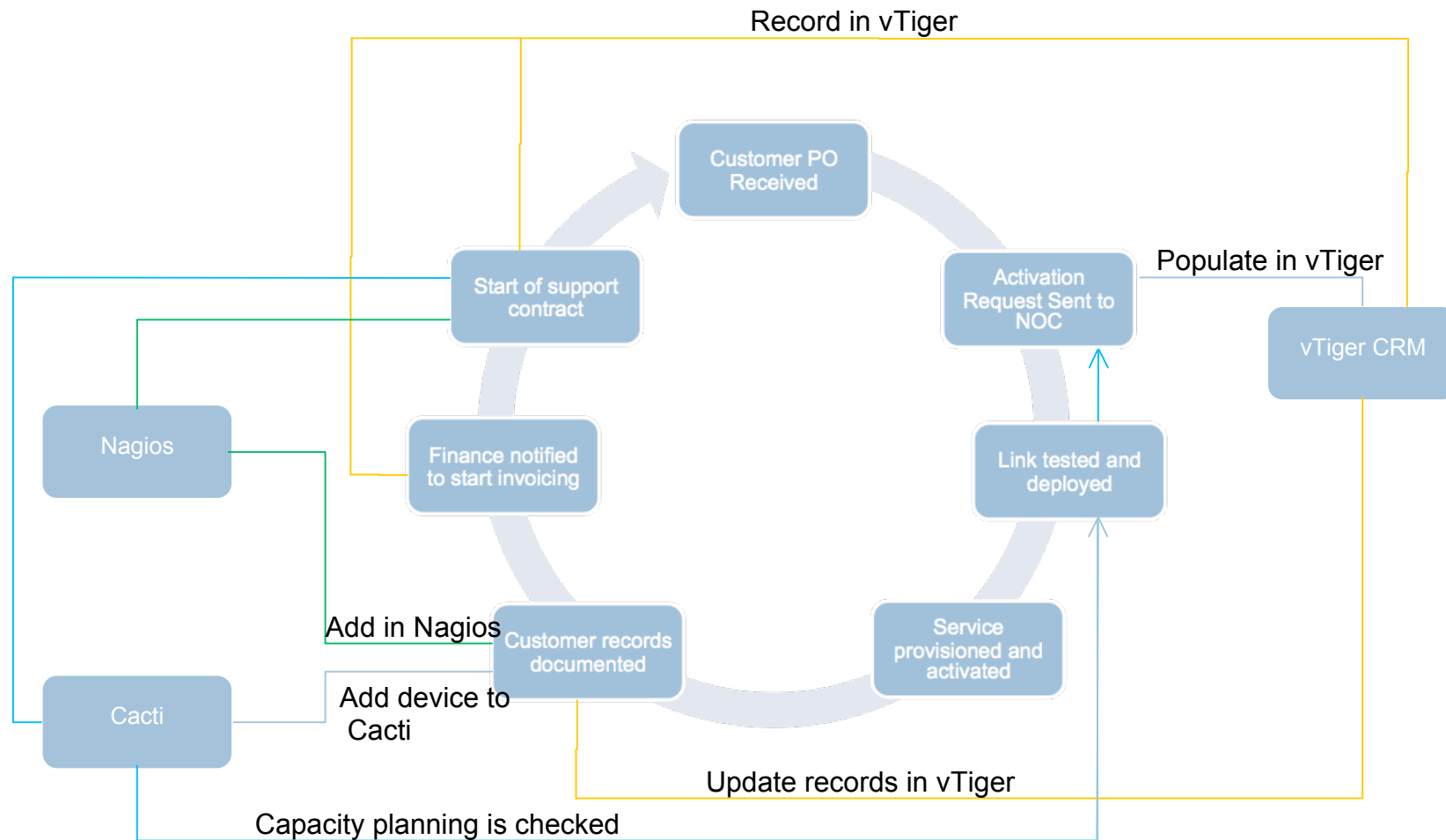-Attachments: network diagram

vTiger Demo

- Windows and Linux-based bundles are available online at www.vtiger.com:

- Live Demo of vTiger 5.0 (2-minute tour):

CLICK HERE

Summary

☐ Workflow re-visited:

Summary

- Conclusion
  - With Cacti, Nagios and vTiger, the ISP daily operation was streamlined
  - Provided complete visibility into the network
  - Shortened the troubleshooting time as information became readily available
  - Comprehensive monitoring of network utilization and environmental variables for devices
- Take away message:
  - Open-source software is robust, scalable and business-ready today

Questions

- Questions, comments or suggestions?