



Prognosis Automation

Workflows with Node.js

Wednesday, October 18, 2017

John Dunne





Download & check-in

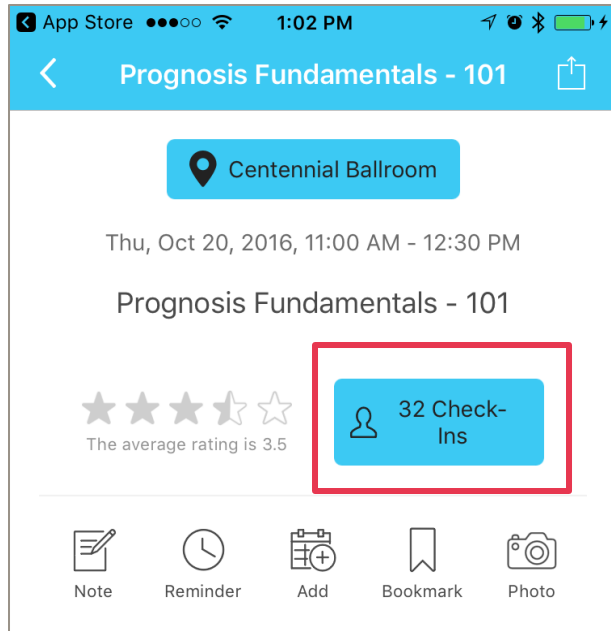
*see your attendance record,
remember what tests to take
and help us improve*

WiFi SSID: IRsummit

WiFi PW: Prognosis



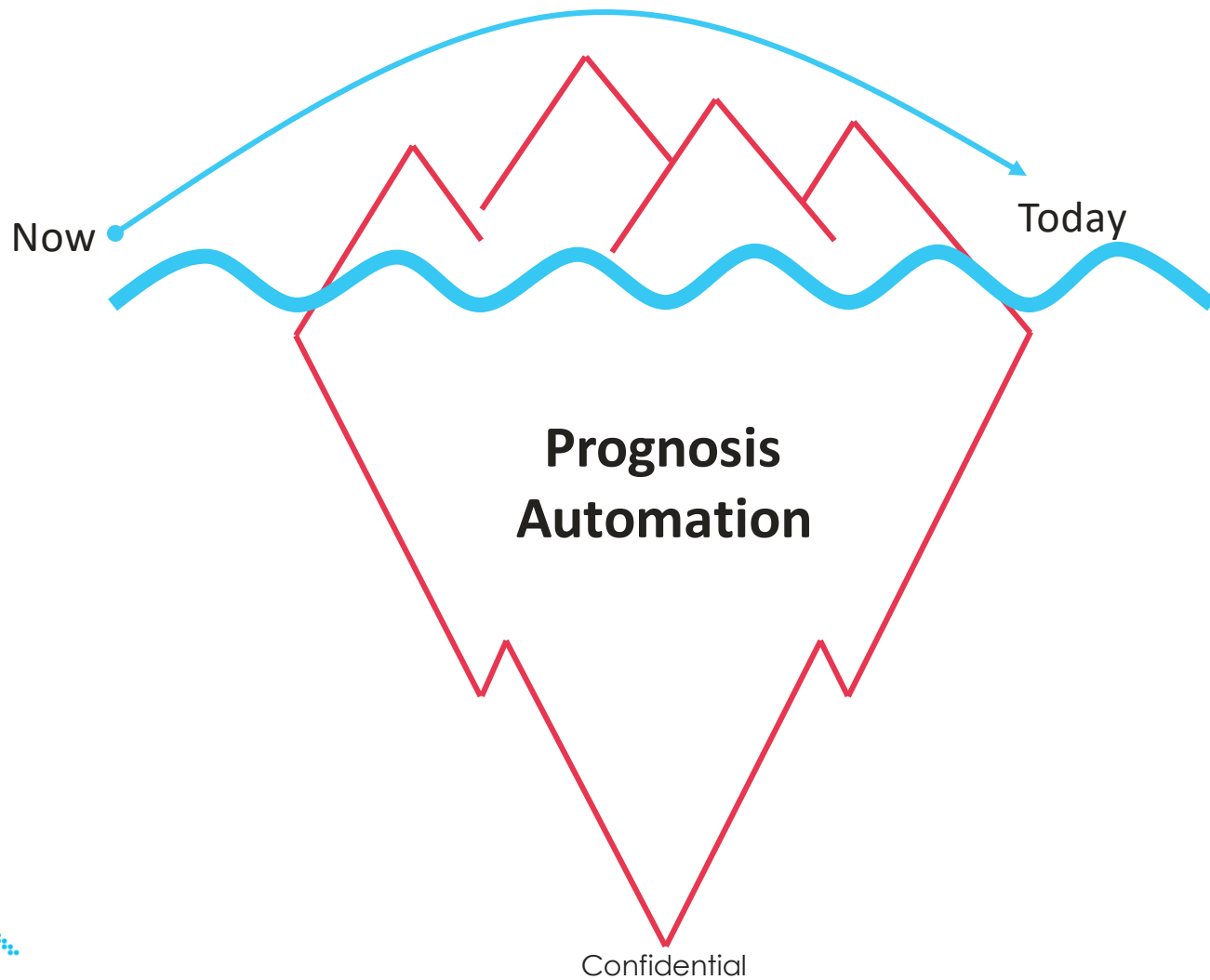
Welcome!





Logistics

- **WiFi SSID:** IRsummit
- **WiFi PW:** Prognosis
- Download the Slides
 - <https://online.prognosis.com>
- Node.js documentation:
 - <https://nodejs.org/dist/latest-v6.x/docs/api/>





Agenda

Part 1

- Prognosis Automation
- My first workflow
- Core Node.js paradigms
- Executing process
- Retrieving Prognosis data

Part 2

- Solution study
- Display integration
- Parameters
- Advanced Node.js



Part 1 Learning Objectives

- After completing this course you should:
 - Know how to invoke a workflow
 - Know where a workflow will run
 - Understand the components of a workflow
 - Be able to modify an existing workflow
 - Execute a process within a workflow
 - Retrieve Prognosis data within a workflow



Prognosis works with Node.js.

- server-side JavaScript
- www.nodejs.org

Prognosis uses Node.js 6.x

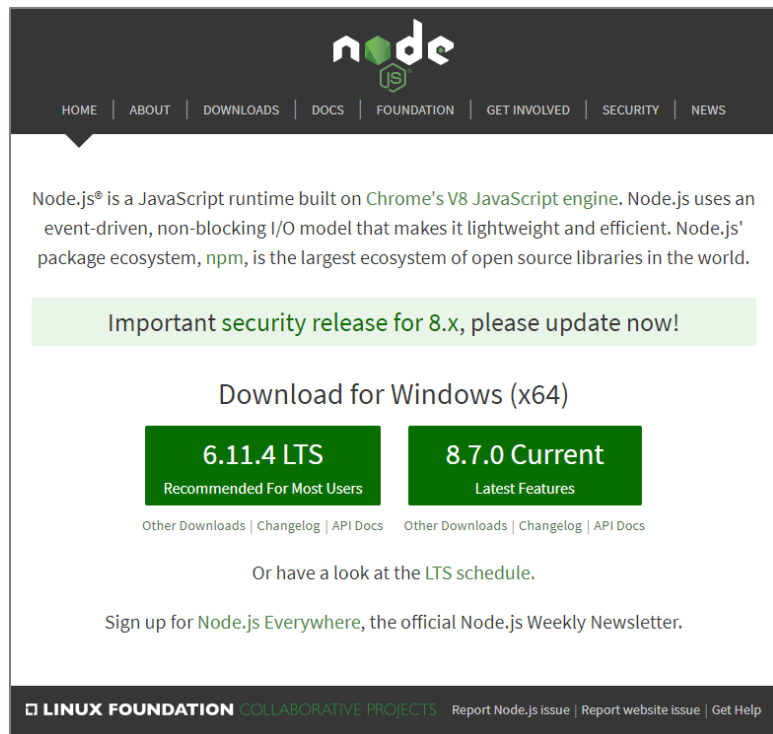
- Node.js 8.x likely for P11.4
- requires AUT license key

```
license - Notepad
File Edit Format View Help
[10.0.2] # Customer "IR JohnD (exp 31-Dec-17)", Expires 2017123
[10.0.2] # NumNodes 250 , NumDevices 0 , NumDevices2 0 , NumDevi
[10.0.2] # OsTypeAllWin=7838 0080
[10.0.2] # Products="PND PNI PNM PR ADI SRV AUT"
[10.0.2] CAE1 4701 8F61 A19B 26C9 888E BE97 A58C EACB F5C0 8940
[10.0.2] 8880 AD84 A6C1 888E BE95 A58C EACB F5C0 8880 AD84 A6C1
[10.0.2] A6C1 888E BE95 A58C EACB F5C0 8880 AD84 A6C1 888E BE95
```



Confidential

Node.js





Prognosis & Node.js

Prognosis can invoke Node.js via:

- the user interface
- a threshold

Node.js can interact with Prognosis:

- send trace information
- retrieve data through PQL
- create data in Prognosis records



Prognosis Workflows

A Workflow is a Prognosis concept

- Encapsulates everything Prognosis needs to know, to run a Node.js

From the WebUI you can

- See all available workflows
- Invoke a workflow



Exercise 1 – Run a Workflow

1. Log in to Prognosis
2. Switch to Admin view
3. Select Automation
4. **“Ex 1 My First Workflow”**
5. Click “Run Now”



The screenshot shows the Prognosis Administration interface. The left sidebar has a navigation menu with 'Automation' highlighted. The main content area displays a table of workflows. A yellow arrow with the number 4 points to the 'Ex1 My First Workflow' entry. At the bottom of the table, there are 'Run Now' and 'View History' buttons. A yellow arrow with the number 5 points to the 'Run Now' button.

Name	Description
Cisco OPCTest	Open Peripheral Controller (OPC) Test
Cisco RTTest	Cisco Intelligent Contact Management (ICM) rttest
Ex1 My First Workflow	Example of writing to the automation log
Ex3 Find Google.com	Example of executing a process
Ex5 Get Prognosis Data	Example of retrieving Prognosis data via PQL
PingTest	Ping Test
PollTest	SNMP Poll Test
Skype for Business Address Book	Tests the ability of a user to access the server that hosts the Address Book Download Web service.
Skype for Business Server Services Status	Verifies the status of the Skype for Business Server services.
Skype for Business Synthetic Calls	Tests the ability of a pair of users to conduct a peer-to-peer audio/video (A/V) call.





Exercise 1 Output

← → ↻ ⚠ Not secure | <https://13.58.232.113/Prognosis/Dashboard/Automation%20Workflow%20Details?defaultnode=%5CWIN-...> ☆

ii prognosis Home Reports Network Alerts Admin Community Help

Automation Workflow Details

Server	WIN-TS3KJED1PB3
Workflow	Ex1 My First Workflow
Status	Completed - OK
Message	Completed successfully

[View History](#)

Workflow Log Output

Time	Output
10/12/17 11:18:36 PM	Begin Workflow
10/12/17 11:18:36 PM	Hello Prognosis Users from Node.js
10/12/17 11:18:36 PM	End Workflow



Storage

Prognosis Workflow are stored on the WebUI Server

- WebUI\IIS\Automation\Workflow\`<workflow name>`

Let's take a look...



Anatomy

workflow.js the node.js file Prognosis will invoke (entry point)

workflow.json meta information about the workflow (name)

instance.json parameters for execution of the workflow



workflow.json

```
{  
  "Description" : "Example of writing to the automation log"  
}
```

The screenshot shows the 'ii prognosis | Administration' interface. On the left is a navigation menu with 'Automation' selected. The main area displays a 'Workflows' table with the following data:

Name	Description
☐ Cisco OPCTest	Open Peripheral Controller (OPC) Test
☐ Cisco RTTest	Cisco Intelligent Contact Management (ICM) rttest
☒ Ex1 My First Workflow	Example of writing to the automation log

Below the table are buttons for 'Run Now' and 'View History'.



Ex1 My First Workflow

Example of writing to the automation log

Directory
Name

{workflow.json}.Description



instance.json

```
{  
  "node" : "\\WIN-TS3KJED1PB3"  
}
```

The Prognosis Server to
execute the workflow on

Can contain additional
parameters
(more on that later)



workflow.js

```
////////////////////////////////////////  
// My First workflow  
  
/*jslint node: true */  
/*jslint plusplus: true */  
"use strict";  
const wf = require('../Engine/workflow_lib');  
  
try  
{  
    //Prelude
```

The workflow logic
starts here



```
1. wf.updateStatus(wf.status.completedOK);  
2. wf.updateMessage('Completed successfully');  
3. wf.logOutput('End workflow');
```

The screenshot shows the 'Automation Workflow Details' page in the Prognosis application. The page displays workflow information and a log output table. Three yellow arrows with numbers 1, 2, and 3 point to specific elements:

- Arrow 1 points to the 'Server' field in the workflow details table.
- Arrow 2 points to the 'Status' field, which is highlighted in green and shows 'Completed - OK'.
- Arrow 3 points to the 'End Workflow' entry in the 'Workflow Log Output' table.

Server	Workflow	Status	Message
WIN-TS3KJED1PB3	Ex1 My First Workflow	Completed - OK	Completed successfully

[View History](#)

Time	Output
10/12/17 11:18:36 PM	Begin Workflow
10/12/17 11:18:36 PM	Hello Prognosis Users from Node.js
10/12/17 11:18:36 PM	End Workflow

//Definition

```
status = {  
    completedOK:      1,  
    completedError:  2,  
    inProgress:       3,  
    failed:           4,  
    terminated:       5  
};
```



Exercise 2 – Clone & Customize

1. File copy the entire folder
 - Rename to Ex2...
2. Edit files
 - Personalize the description & message
3. Run it



Use Cases (interaction)

Execute a process

E.g. Basic diagnostic checks: DNS, ping, tracer

Integrate a system

E.g. HTTPS into Time Management to find a person on duty

Interrogate an application

E.g. REST API into an otherwise unmanaged application

Interface to a device

E.g. Telnet into and reboot a Wi-Fi access point



Use Cases (internal)

Read Prognosis data

E.g. Complex state machine

Create Prognosis data

E.g. Download the weather and put in a record

Reconfigure Prognosis

E.g. Add a PBX / Server, stop/start database/threshold

Access Secure Prognosis Credentials

E.g. Credentials for Wi-Fi access point (for telnet)



Executing a Process

TraceRt (aka TraceRoute)

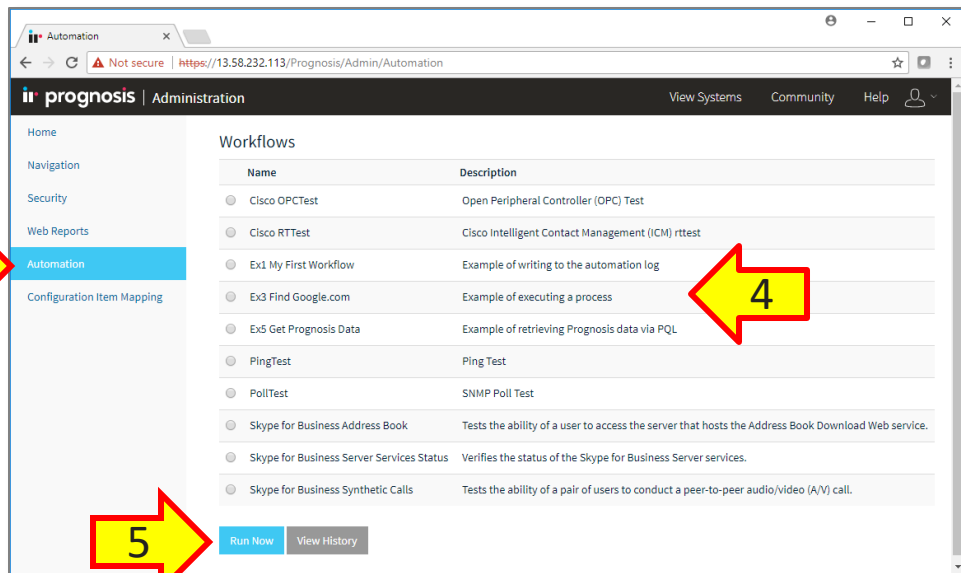
Simple diagnostic

- can the DNS be resolved?
- what is the network path?
- does it respond to ping?



Exercise 3 – Find Google.com

1. Log in to Prognosis
2. Switch to Admin view
3. Select Automation
4. **“Ex3 Find Google.com”**
5. Click “Run Now”





Exercise 3

Output

ii prognosis

HomeReportsNetworkAleAdminCommunityHelp

Automation Workflow Details

ServerWIN-TS3KJED1PB3

WorkflowEx3 Find Google.com

StatusCompleted - OK

MessageCompleted successfully

View History

Workflow Log Output

Time	Output
10/12/17 11:31:30 PM	Begin Workflow
10/12/17 11:31:30 PM	Trace launching
10/12/17 11:31:30 PM	
10/12/17 11:31:30 PM	Tracing route to google.com [172.217.7.174]
10/12/17 11:31:30 PM	over a maximum of 30 hops:
10/12/17 11:31:30 PM	
10/12/17 11:31:42 PM	1 * * * Request timed out.
10/12/17 11:31:54 PM	2 * * * Request timed out.
10/12/17 11:32:06 PM	3 * * * Request timed out.
10/12/17 11:32:18 PM	4 * * * Request timed out.
10/12/17 11:32:30 PM	5 * * * Request timed out.
10/12/17 11:32:30 PM	6 <1 ms <1 ms <1 ms 100.65.11.129
10/12/17 11:32:31 PM	7 <1 ms <1 ms <1 ms 52.95.1.37
10/12/17 11:32:32 PM	8 <1 ms 8 ms 10 ms 52.95.1.142
10/12/17 11:32:33 PM	9 <1 ms <1 ms <1 ms 52.95.1.145
10/12/17 11:32:34 PM	10 11 ms 11 ms 11 ms 54.239.42.133
10/12/17 11:32:47 PM	11 * * * Request timed out.
10/12/17 11:32:47 PM	12 27 ms 35 ms 21 ms 54.239.108.80
10/12/17 11:32:48 PM	13 11 ms 10 ms 10 ms 54.239.108.69
10/12/17 11:32:50 PM	14 11 ms 10 ms 10 ms 72.14.203.120
10/12/17 11:32:51 PM	15 11 ms 11 ms 11 ms 108.170.240.97
10/12/17 11:32:52 PM	16 11 ms 11 ms 10 ms 216.239.54.15
10/12/17 11:32:53 PM	17 11 ms 10 ms 10 ms iad30s09-in-f174.1e100.net [172.217.7.174]
10/12/17 11:32:53 PM	
10/12/17 11:32:53 PM	Trace complete.
10/12/17 11:32:53 PM	Trace complete code=0
10/12/17 11:32:53 PM	End Workflow



Child_Process

Spawn

- Any application
- stdout pipe
 - read as created
- detach available

https://nodejs.org/dist/latest-v6.x/docs/api/child_process.html#child_process_child_process_spawn_command_args_options

Exec

- Command line / console
- stdout string
 - at completion
- timeout available

https://nodejs.org/dist/latest-v6.x/docs/api/child_process.html#child_process_child_process_exec_command_options_callback

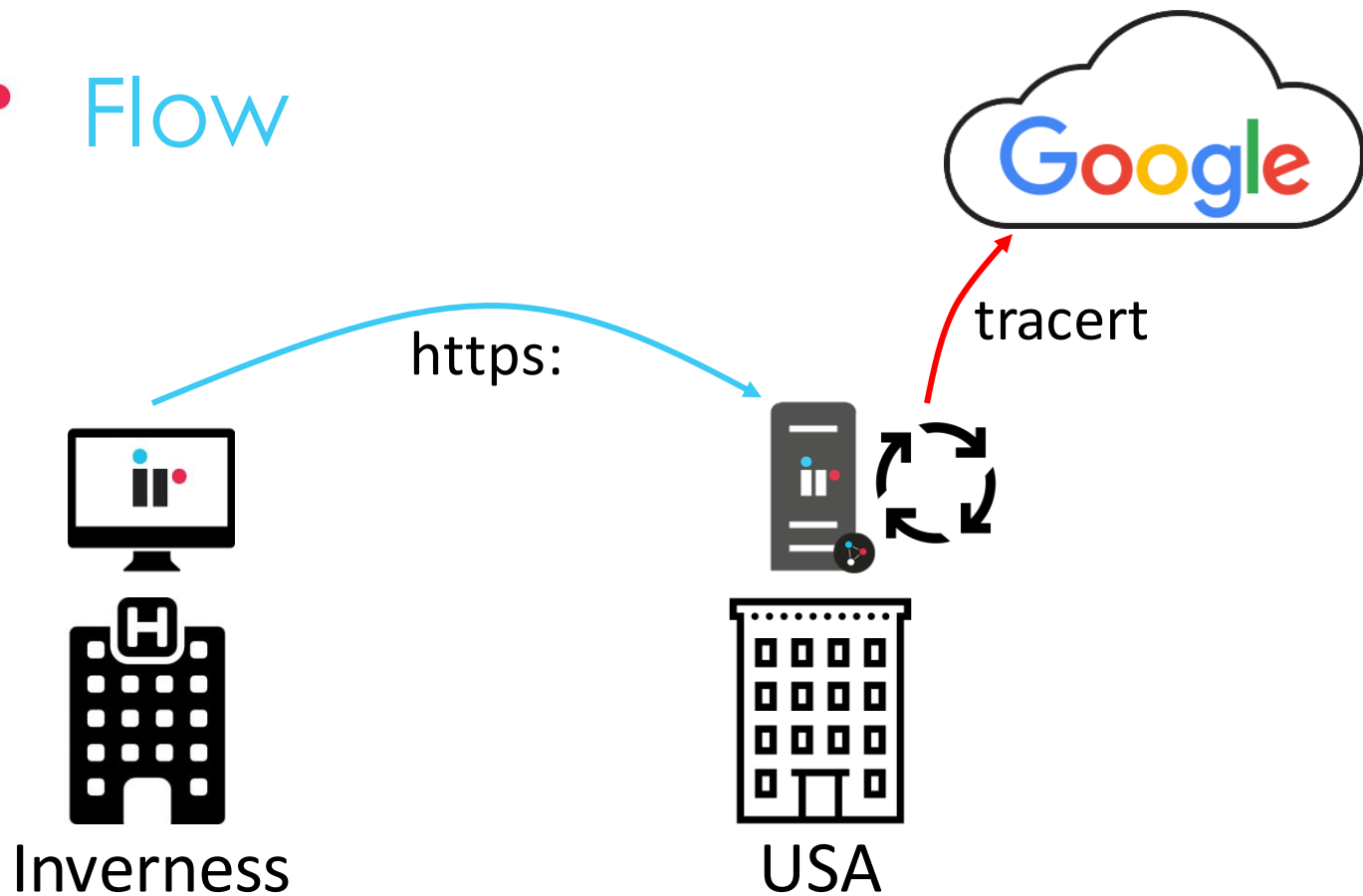


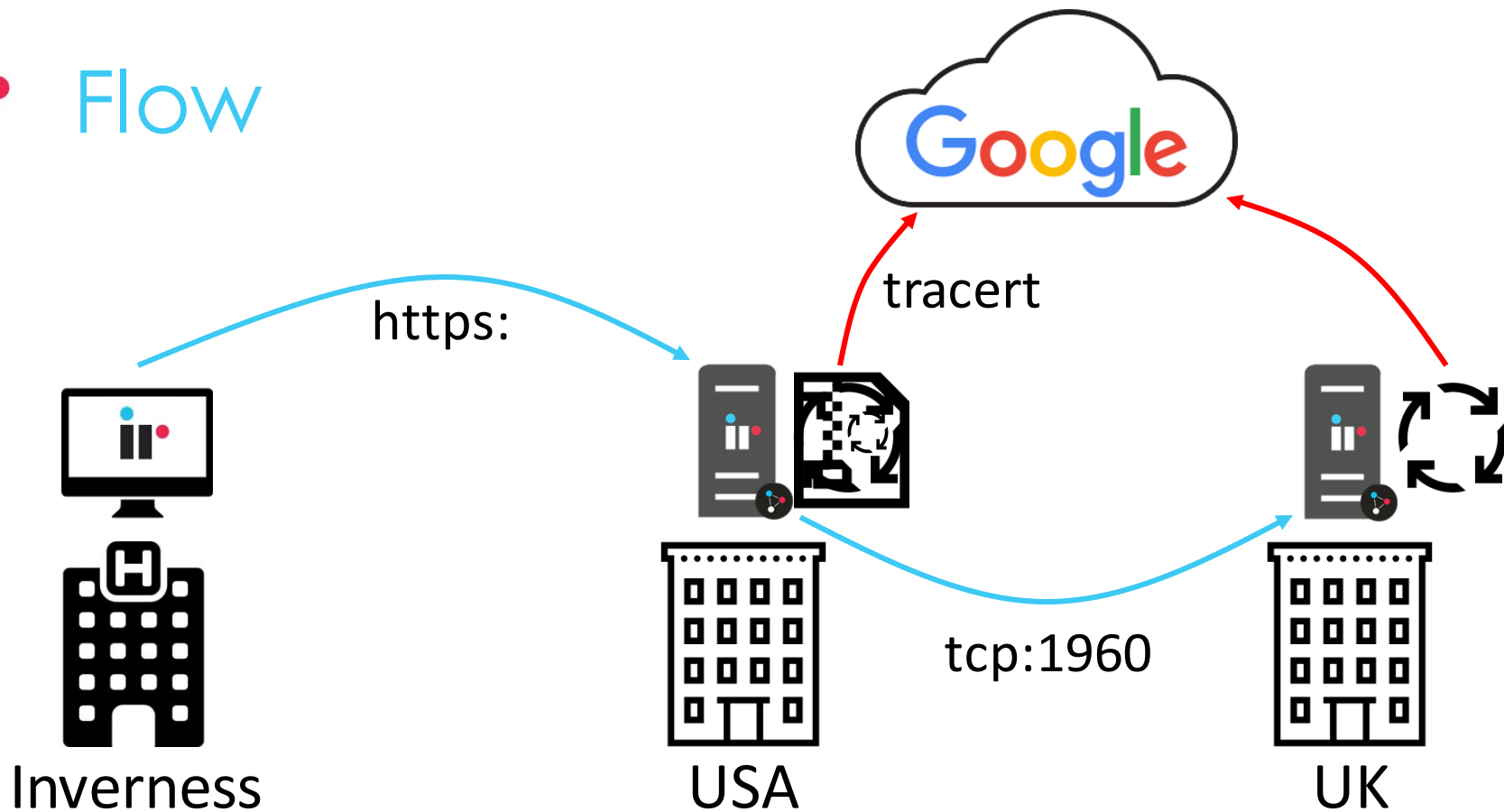
Second Instance

Fact: TraceRt takes time to run.

Q: What happens if I run a second instance of the workflow (on the same machine)?

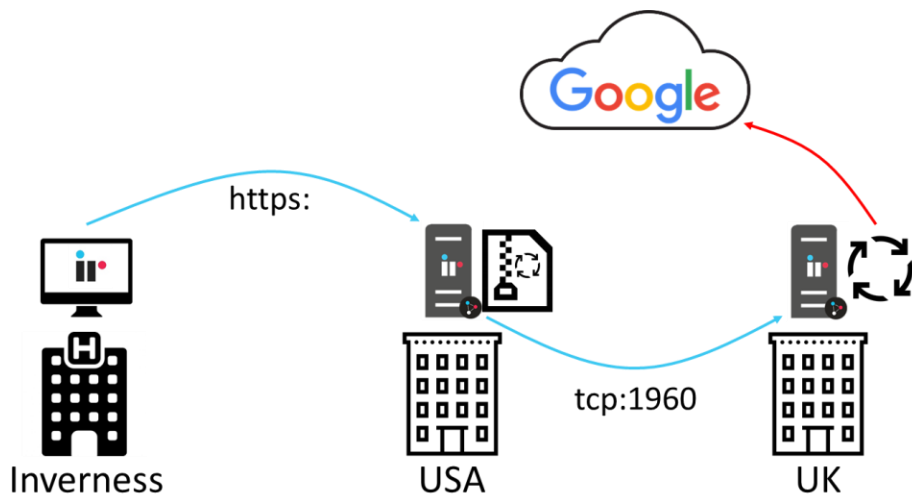
A: The running instance is aborted, and the new instance is started.







Exercise 4



London Server:
\\WIN-L7MVFNG405G

Modify workflow...
name
instance.json



Node.js Paradigms

1. Template Literals
 - Simply formatting messages with data
2. Exceptions vs Errors
 - When to throw, when to return
3. Asynchronous Functions
 - Understanding code and it's order of execution, especially with Events
4. Paradigms for robust & simple code
 - Looping around asynchronous functions
 - Conditionally executing asynchronous functions



Template Literals

String concatenation:

```
'CPU ' + record.CpuNumber + ' = ' + record.BusyPercent + '%'
```

String template:

```
`CPU ${record.CpuNumber} = ${record.BusyPercent}%`
```

Enables:

- String interpolation (runtime evaluation of `${variable}`)
- Multi-line strings (just hit enter)



Errors

err is an instance of an Error class

- but sometimes a String if I'm lazy

Return err as a parameter in callbacks

- unable to succeed

Throw err on terminal issues only

- abort the workflow

Catch err at the root

- inform the user, contain the situation

```
return  
  process.nextTick(done, 'Oops!');
```

```
if (err)  
  return process.nextTick(done, err);
```

```
if (err) throw err;
```

```
try{ //Do stuff  
}  
catch(err){ //Handle err  
}
```



Asynchronous Functions


asynchronous.js.txt


input.txt

```
const fs = require('fs');  
  
console.log('Start');  
  
fs.readFile('input.txt', (err, data) => {  
  if (err) throw err;  
  console.log(data);  
});  
  
console.log('Done');
```

Start
Done
data



Looping with Async Functions

```
var    todoList = [...];    //list to process
var    doIt = function(todoIndex, done) { //process one
    if (todoIndex >= todoList.size) return process.nextTick(done); //done
    //do async operation
    doAsyncOperation(todoList[todoIndex], (err) {
        if (err) return process.nextTick(done, err); //error
        process.nextTick(doIt, todoIndex+1);    //next
    })
}
doIt(0);    //start processing
```



process.nextTick

```
process.nextTick(doIt, todoIndex+1);
```

//vs

```
doIt(todoIndex+1);
```

Add it to the end of the message queue for execution when idle

vs

Push it on the call stack now and execute



Using PQL

Any Prognosis record is accessible by PQL

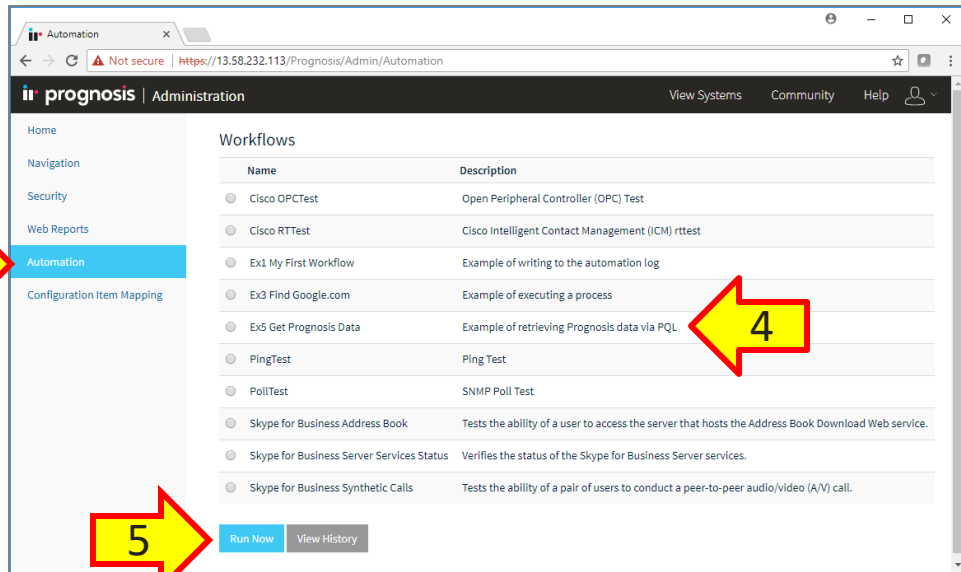
- Prognosis Query Language (pretty close to SQL)

```
SELECT CpuNumber, BusyPercent  
FROM NTCPU
```



Exercise 5 – Get Prognosis Data

1. Log in to Prognosis
2. Switch to Admin view
3. Select Automation
4. **“Ex5 Get Prognosis Data”**
5. Click “Run Now”





Exercise 5 Output



Automation Workflow De x

← → ↻ ⚠ Not secure | <https://13.58.232.113/Prognosis/Dashboard/Automation%20Workflow%20Detail...> ☆ ⋮

ii prognosis Home Reports Network 🔍 Admin Community

Automation Workflow Details

Server	WIN-TS3KJED1PB3
Workflow	Ex5 Get Prognosis Data
Status	Completed - OK
Message	Completed successfully

[View History](#)

Workflow Log Output

Time	Output
10/13/17 12:10:31 AM	Begin Workflow
10/13/17 12:10:31 AM	Connecting to local PQL
10/13/17 12:10:31 AM	Connected to local PQL
10/13/17 12:10:31 AM	Selecting data
10/13/17 12:10:40 AM	Selected data
10/13/17 12:10:40 AM	CPU 0 = 12.12%
10/13/17 12:10:40 AM	CPU 1 = 16.37%
10/13/17 12:10:40 AM	CPU 2 = 15.23%
10/13/17 12:10:40 AM	CPU 3 = 15.40%
10/13/17 12:10:40 AM	End Workflow

Confidential



Using PQL

Any Prognosis record is accessible by PQL

- Prognosis Query Language (pretty close to SQL)

```
SELECT CpuNumber, BusyPercent  
FROM NTCPU
```



workflow-pql

```
const PQL = require('./workflow-pql').PQL;
```

Prognosis 11.3 has a very raw PQL interface, so I created this wrapper class.

- It requires './workflow-logger' (wraps default logger)
- Just include files in the workflow folder!



workflow-pql

```
var pql = new PQL();
```

```
pql.connect( function(err, data) {});
```

```
pql.select('SELECT * FROM NTCPU', function(err, ntCPU) {});
```

ntCPU[0].CpuNumber

Field name

row



```
var pq1 = new PQL();
```

```
pq1.selectBatch( ['SELECT * FROM NTCPU',  
                  'SELECT * FROM NTCPU'],  
                  function(err, tables) {});
```

table

tables.NTCPU[0].CpuNumber

Field name

row



Test PQL

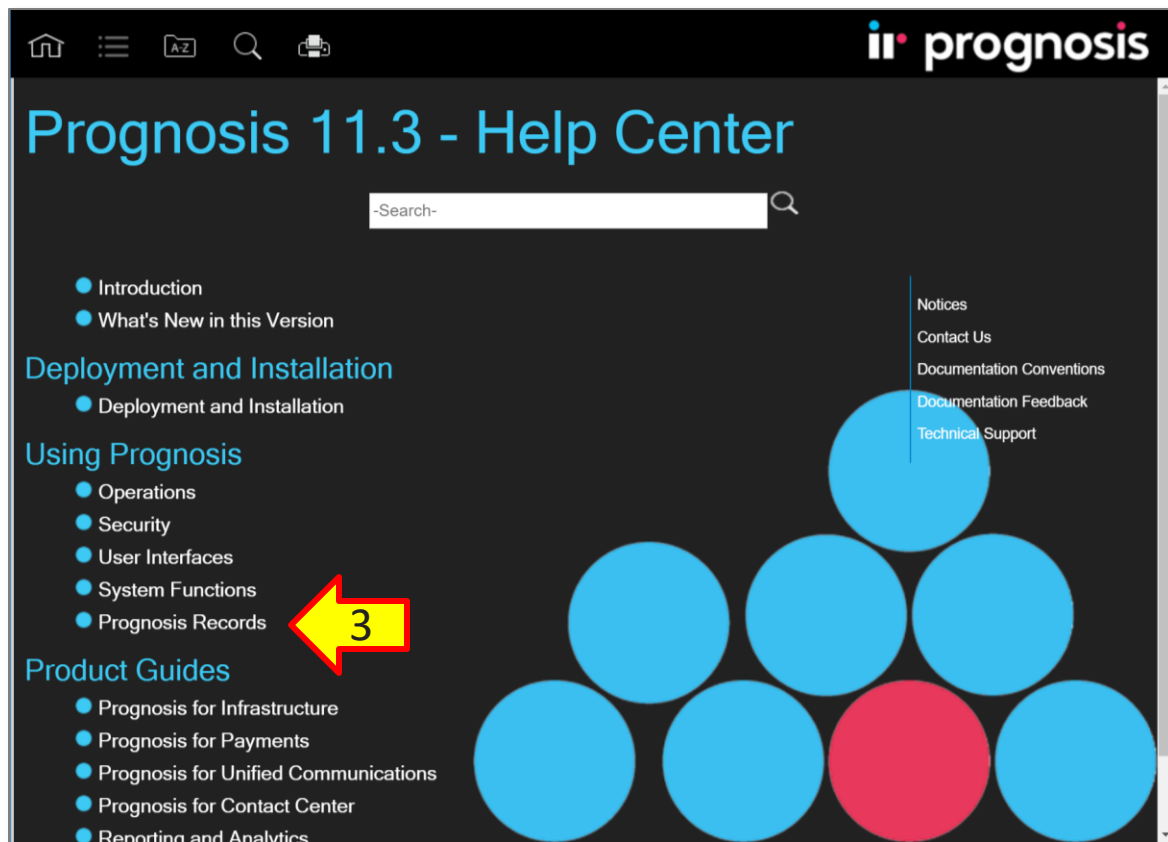
```
Command Prompt
C:\Prognosis\Server\Configuration>..\irpqlcli "SELECT CpuNumber, PercentBusy FROM NTCPU"
Error - Code '6' Token 'PercentBusy' Message 'Field not found 'PercentBusy''
C:\Prognosis\Server\Configuration>

Command Prompt
C:\Prognosis\Server\Configuration>..\irpqlcli "SELECT CpuNumber, BusyPercent FROM NTCPU"
CpuNumber      BusyPercent
0              34.08
1              42.04
2              44.54
3              37.50
C:\Prognosis\Server\Configuration>
```



What are the records?

1. Log in to Prognosis
2. Online Help
- 3. Prognosis Records**
4. Long Record Names





Exercise 6

Get the Busiest Processes

1. Copy “Ex 5 Get Prognosis Data” to “Ex 6 Get Busiest Processes”
2. On the command line, verify a statement to get the busiest 20 processes
3. Update the Workflow
4. Run it!



Tip - Record

Record = NtProcess

- ProcessId
- ProcessName
- BusyPercent
- BusyUserPercent
- BusyPrivilegedPercent



Tip - PQL

SELECT TOP 10

ProcessId, ProcessName, BusyPercent

FROM NtProcess

ORDER BY ProcessName DESC



Prognosis Automation

Workflows with Node.js

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Agenda

Part 1

- Prognosis Automation
- My first workflow
- Core Node.js paradigms
- Executing process
- Retrieving Prognosis data

Part 2

- Solution study
- Display integration
- Parameters



Part 1 Learning Objectives

- After completing this course you should:
 - Familiar with display integration
 - Be able to pass parameters
 - Be able to read parameters



Test Your Knowledge

What license code enables Prognosis Workflows?

- a) WFL
- b) AUT
- c) WOR
- d) PWF



Test Your Knowledge

Which 3 files are required in a Workflow file?

- a) workflow.js
- b) workflow.json
- c) instance.js
- d) instance.json



Test Your Knowledge

What Node.js library enables sending status and messages to Prognosis?

- a) workflow_lib.js
- b) prognosis.js
- c) workflow.js
- d) prognosis_lib.js



Test Your Knowledge

Which command is best for executing a command and reading the entire output as a string?

- a) `child_process.spawn`
- b) `child_process.exec`
- c) `child_process.run`



Ping Get the Busiest Processes

1. Log into Prognosis
2. Second navigation tab
3. Prognosis Utility

Prognosis Utility Dashboard

Node Name	Node Type	IP Address	Cluster	Customer	Source Node	Site	Launch	Launch
10.101.1.172	Server	1.1.1.1	WIN-TSJKJED1PB3		WIN-TSJKJED1PB3		Ping	Poll
10.101.1.174	Server	1.1.1.1	WIN-TSJKJED1PB3		WIN-TSJKJED1PB3		Ping	Poll
AACCL1		10.111.1.81	AWVA_AACC		WIN-TSJKJED1PB3		Ping	Poll
AEP-EPM		10.111.1.82	AWVA_AEP		WIN-TSJKJED1PB3		Ping	Poll
AERO-CUC-AERO-IMO	publisher	10.13.6.10	AERO-CUC	AEROTECH	WIN-TSJKJED1PB3	US	Ping	Poll
AERO-CUC-AERO-IMO	subscriber	10.13.6.11	AERO-CUC	AEROTECH	WIN-TSJKJED1PB3	US	Ping	Poll
AES-SIM		10.116.102.227	AWVA_AES		WIN-TSJKJED1PB3		Ping	Poll
AES1		10.102.1.89	AWVA_AES		WIN-TSJKJED1PB3		Ping	Poll
AURA-SMR		10.111.1.14	AWVA_SYSTEM_MANAGE	OrDotCom	WIN-TSJKJED1PB3	Sydney	Ping	Poll
AVAYASASS	Server	10.111.1.143	AWVA_SESSION_MANAGE		WIN-TSJKJED1PB3	Sydney	Ping	Poll
AVSESS-DENVER	Server	5.6.7.8	AWVA_SESSION_MANAGE		WIN-TSJKJED1PB3	Melbourne	Ping	Poll
AVSESS-SYDNEY	Server	1.1.1.1	AWVA_SESSION_MANAGE		WIN-TSJKJED1PB3	Sydney	Ping	Poll
BRONTE		192.168.255.2	AWVA_PBX	OrDotCom	WIN-TSJKJED1PB3		Ping	Poll
BUDAPEST-LSP		127.0.0.1	AWVA_LSP	JR Parvis	WIN-TSJKJED1PB3	Europe	Ping	Poll
BUENOSAIRE-LSP		127.0.0.1	AWVA_LSP	JR Parvis	WIN-TSJKJED1PB3	Americas	Ping	Poll
ICMA02	PolycomCMAS	192.168.171.92	POLYCOM		WIN-TSJKJED1PB3	NY	Ping	Poll
COFFEE-CUC-COFFEE	publisher	10.13.3.10	COFFEE-CUC	COFFEEHAX	WIN-TSJKJED1PB3	CANADA	Ping	Poll
COFFEE-CUC-COFFEE	subscriber	10.13.3.11	COFFEE-CUC	COFFEEHAX	WIN-TSJKJED1PB3	CANADA	Ping	Poll
CONFERENCE_ROOM	PolycomDX0006	172.22.171.58	POLYCOM		WIN-TSJKJED1PB3	NY	Ping	Poll
CONFERENCE_ROOM	PolycomDX0006	172.22.171.59	POLYCOM		WIN-TSJKJED1PB3	NY	Ping	Poll
CONFERENCE_ROOM	PolycomDX0006	192.168.168.141	POLYCOM		WIN-TSJKJED1PB3	NY	Ping	Poll
COOLADS-CUC-CADS-	publisher	10.13.5.10	COOLADS-CUC	COOLADS	WIN-TSJKJED1PB3	US	Ping	Poll
COOLADS-CUC-CADS-	subscriber	10.13.5.11	COOLADS-CUC	COOLADS	WIN-TSJKJED1PB3	US	Ping	Poll
CS300S-45		192.168.255.1	NORTE_PBX	JR Parvis	WIN-TSJKJED1PB3	Sydney	Ping	Poll
DMA01	PolycomDMA7	192.168.171.03	POLYCOM		WIN-TSJKJED1PB3	NY	Ping	Poll
DMA1_LAB1	PolycomDMA7	192.168.171.235	POLYCOM		WIN-TSJKJED1PB3	NY	Ping	Poll
GENEVSYS1-SRVRB1		10.102.2.117	GENEVSYS		WIN-TSJKJED1PB3		Ping	Poll
GUAM-LSP		127.0.0.1	AWVA_LSP	JR Parvis	WIN-TSJKJED1PB3	Americas	Ping	Poll
IPO-PBX	ServerEdition	192.168.200.1	AWVA_IP0	OrDotCom	WIN-TSJKJED1PB3	Denver	Ping	Poll
IRSDY		192.168.255.3	AWVA_PBX	OrDotCom	WIN-TSJKJED1PB3	Sydney	Ping	Poll
IST1		127.0.0.1	IST		WIN-TSJKJED1PB3	1	Ping	Poll
ISTANBUL-LSP		127.0.0.1	AWVA_LSP	JR Parvis	WIN-TSJKJED1PB3	Europe	Ping	Poll
JRP-CCX-JRP-CCX	publisher	10.110.80.121	JRP-CCX	JR Parvis	WIN-TSJKJED1PB3	India	Ping	Poll
JRP-CER-JRP-CER	publisher	10.91.41.102	JRP-CER	JR Parvis	WIN-TSJKJED1PB3	India	Ping	Poll
JRP-CUC-JRP-CUC	publisher	10.131.1.0	JRP-CUC	JR Parvis	WIN-TSJKJED1PB3	India	Ping	Poll
JRP-CUP-PUB	publisher	10.102.1.180	JRP-CUP	JR Parvis	WIN-TSJKJED1PB3	India	Ping	Poll
JRP-CUP-SUB	subscriber	10.102.1.181	JRP-CUP	JR Parvis	WIN-TSJKJED1PB3	India	Ping	Poll
JRP-MUMBAI-MUMBA	subscriber	10.131.1.11	JRP-MUMBAI	JR Parvis	WIN-TSJKJED1PB3	India	Ping	Poll
JRP-MUMBAI-MUMBA	subscriber	10.131.1.12	JRP-MUMBAI	JR Parvis	WIN-TSJKJED1PB3	India	Ping	Poll
JRP-MUMBAI-MUMBA	subscriber	10.131.1.13	JRP-MUMBAI	JR Parvis	WIN-TSJKJED1PB3	India	Ping	Poll
JRP-MUMBAI-MUMBA	subscriber	10.131.1.14	JRP-MUMBAI	JR Parvis	WIN-TSJKJED1PB3	India	Ping	Poll

Prognosis Utility Dashboard

Printer Friendly Excel Export Add to Mashup

Prognosis Utility

Node Name	Node Type	IP Address	Cluster	Customer	Source Node	Site	Launch	Launch
\10.101.1.172	Server	1.1.1.1	\WIN-TS3KJED1PB3		\WIN-TS3KJED1PB3		Ping	Poll
\10.101.1.174	Server	1.1.1.1	\WIN-TS3KJED1PB3		\WIN-TS3KJED1PB3		Ping	Poll
\AAC1		10.111.1.81	AVAYA_AACC		\WIN-TS3KJED1PB3		Ping	Poll
\AEP-EPM		10.111.1.82	AVAYA_AEP		\WIN-TS3KJED1PB3		Ping	Poll
\AERO-CUC:AERO-VM01	publisher	10.13.6.10	AERO-CUC	AEROTECH	\WIN-TS3KJED1PB3	US	Ping	Poll
\AERO-CUC:AERO-VM02	subscriber	10.13.6.11	AERO-CUC	AEROTECH	\WIN-TS3KJED1PB3	US	Ping	Poll
\AES-SIM		10.116.102.227	AVAYA_AES		\WIN-TS3KJED1PB3		Ping	Poll
\AES1		10.102.1.89	AVAYA_AES		\WIN-TS3KJED1PB3		Ping	Poll
\AURA-SMGR		10.111.1.114	AVAYA_SYSTEM_MANAGER	OzDotCom	\WIN-TS3KJED1PB3	Sydney	Ping	Poll
\AVAYASISS	Server	10.111.1.143	AVAYA_SESSION_MANAGER		\WIN-TS3KJED1PB3	Sydney	Ping	Poll
\AVSSESS-DEWIVER	Server	5.6.7.8	AVAYA_SESSION_MANAGER		\WIN-TS3KJED1PB3	Melbourne	Ping	Poll
\AVSSESS-SYDNEY	Server	1.1.1.1	AVAYA_SESSION_MANAGER		\WIN-TS3KJED1PB3	Melbourne	Ping	Poll
\BRONTE		192.168.255.2	AVAYA_PBX	OzDotCom	\WIN-TS3KJED1PB3	Sydney	Ping	Poll
\BUDAPEST-LSP		127.0.0.1	AVAYA_LSP	JR Parvis	\WIN-TS3KJED1PB3	Europe	Ping	Poll
\BUENOSAIRES-LSP		127.0.0.1	AVAYA_LSP	JR Parvis	\WIN-TS3KJED1PB3	Americas	Ping	Poll
\CMA02	PolycmCMA5	192.168.171.92	POLYCOM		\WIN-TS3KJED1PB3	NY	Ping	Poll
\COFFEE-CUC:COFFEE-VM0	publisher	10.13.3.10	COFFEE-CUC	COFFEEEMAX	\WIN-TS3KJED1PB3	CANADA	Ping	Poll
\COFFEE-CUC:COFFEE-VM0	subscriber	10.13.3.11	COFFEE-CUC	COFFEEEMAX	\WIN-TS3KJED1PB3	CANADA	Ping	Poll
\CONFERENCE_ROOM_100	PolycmHDX9006	172.22.171.58	POLYCOM		\WIN-TS3KJED1PB3	NY	Ping	Poll
\CONFERENCE_ROOM_101	PolycmHDX9006	172.22.70.175	POLYCOM		\WIN-TS3KJED1PB3	NY	Ping	Poll
\CONFERENCE_ROOM_102	PolycmHDX8000	192.168.168.141	POLYCOM		\WIN-TS3KJED1PB3	NY	Ping	Poll
\COOLADS-CUC:CADS-VM01	publisher	10.13.5.10	COOLADS-CUC	COOLADS	\WIN-TS3KJED1PB3	US	Ping	Poll
\COOLADS-CUC:CADS-VM02	subscriber	10.13.5.11	COOLADS-CUC	COOLADS	\WIN-TS3KJED1PB3	US	Ping	Poll
\CS1000S-45		192.168.255.1	NORTEL_PBX	JR Parvis	\WIN-TS3KJED1PB3	Sydney	Ping	Poll
\DMA01	PolycmDMA7	192.168.171.93	POLYCOM		\WIN-TS3KJED1PB3	NY	Ping	Poll
\DMA02	PolycmDMA7	192.168.171.94	POLYCOM		\WIN-TS3KJED1PB3	NY	Ping	Poll
\DMA_LAB1	PolycmDMA7	192.168.171.235	POLYCOM		\WIN-TS3KJED1PB3	NY	Ping	Poll
\GENESYS1:SERVER1	SnmpMasterAgent	10.102.2.117	GENESYS		\WIN-TS3KJED1PB3		Ping	Poll
\GUAM-LSP		127.0.0.1	AVAYA_LSP	JR Parvis	\WIN-TS3KJED1PB3	Americas	Ping	Poll
\IPO-PBX	ServerEdition	192.168.200.1	AVAYA_IPO	OzDotCom	\WIN-TS3KJED1PB3	Denver	Ping	Poll
\IRSVD		192.168.255.3	AVAYA_PBX	OzDotCom	\WIN-TS3KJED1PB3	Sydney	Ping	Poll
\IST1		127.0.0.1	IST		\WIN-TS3KJED1PB3	1	Ping	Poll
\ISTANBUL-LSP		127.0.0.1	AVAYA_LSP	JR Parvis	\WIN-TS3KJED1PB3	Europe	Ping	Poll
\JRP-CCX:JRP-CCX	publisher	10.110.80.121	JRP-CCX	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-CER:JRP-CER	publisher	10.91.41.102	JRP-CER	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-CUC:JRP-CUC	publisher	10.13.1.10	JRP-CUC	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-CUP-PUB	publisher	10.102.1.180	JRP-CUP	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-CUP-SUB	subscriber	10.102.1.181	JRP-CUP	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-MUMBAI-MUMBAICM1	subscriber	10.131.1.11	JRP-MUMBAI	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-MUMBAI-MUMBAICM2	subscriber	10.131.1.12	JRP-MUMBAI	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-MUMBAI-MUMBAICM3	subscriber	10.131.1.13	JRP-MUMBAI	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-MUMBAI-MUMBAICM4	subscriber	10.131.1.14	JRP-MUMBAI	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-MUMBAI-MUMBAICMP	publisher	10.131.1.10	JRP-MUMBAI	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-MUMBAI-MUMBAICUP	subscriber	10.131.100.21	JRP-MUMBAI	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-MUMBAI-MUMBAICUP	subscriber	10.131.100.22	JRP-MUMBAI	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-MUMBAI-MUMBAIMOF	subscriber	10.131.1.21	JRP-MUMBAI	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-MUMBAI-MUMBAIMOF	subscriber	10.131.1.22	JRP-MUMBAI	JR Parvis	\WIN-TS3KJED1PB3	India	Ping	Poll
\JRP-UCCE:AWHDSCCA	awhds	172.20.30.30	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll
\JRP-UCCE:AWHDSCCB	awhds	172.20.30.91	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll
\JRP-UCCE:CUICCCA	cuic	172.20.30.37	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll
\JRP-UCCE:CUICCCB	cuic	172.20.30.38	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll
\JRP-UCCE:CVPCSCCA	cvp	172.20.30.32	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll
\JRP-UCCE:CVPCSCCB	cvp	172.20.30.33	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll
\JRP-UCCE:CVPCSCCC	cvp	172.20.30.34	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll
\JRP-UCCE:PGCC1A	pglctios	172.20.30.19	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll
\JRP-UCCE:PGCC1B	pglctios	172.20.30.24	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll
\JRP-UCCE:PGCC2A	pgldialer	172.20.30.21	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll
\JRP-UCCE:PGCC2B	pgldialer	172.20.30.27	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll
\JRP-UCCE:RGRCOA	logger/router	172.20.30.11	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll
\JRP-UCCE:RGRCOB	logger/router	172.20.30.16	JRP-UCCE	JR Parvis	\WIN-TS3KJED1PB3	Brisbane	Ping	Poll



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How this works

1. Custom Dashboard
2. Modify field display
3. Add a drilldown to Automation Service



.dashboard

File name = URL

Stored in:

\WebUI\IIS\Dashboards\User

Created by:

a) Publishing a Windows display & modify it



Columns to Initiate Workflow

```
<datafield
```

```
  name="PrognosisNode_PingTest"
```

```
  visible="true"
```

```
  static="true"
```

```
  precision="-1"
```

```
  command="true"
```

```
  automation="true"
```



Drilldown

```
<drilldown><query>
SELECT 'Automation Service?' +
      'workflow=' + URIENCODE('PingTest') +
      '&' + 'DefaultNode=\' +
          URIENCODE(COALESCE(SourceNodeWhoRegisteredThisNode, '')) +
      '&' + 'ip=' + URIENCODE(TcpIpAddress) +
      '&' + 'node=\' + URIENCODE(COALESCE(PrognosisNodeName, ''))
AS PrognosisNode_PingTest,
FROM User_Custom_UtilityDashboard_PNodesView
^[where_Interval]^
^[Latest]^
</query></drilldown>
```



Challenge 1

1. Create a custom display (maybe clone one)
 - Ensure it has a data table
2. Publish it to web
3. Add to the navigation pane (for easy access)
4. Modify the .dashboard to include Automation



Installing additional node_modules

Node_modules are stored in:

<Prognosis>\Nodejs\node_modules

From NodeJs directory use npm install
internet access required

<Prognosis>\Nodejs>npm install <package>



Invoking from a Threshold

Server\Configuration\Automation\workflow\runw.bat **“WorkflowName”**

Workflow needs to be on the server (already pushed to server)

A screenshot of the 'Threshold Condition' dialog box. The 'Command' tab is selected. The 'Execute command for:' dropdown is set to 'On Event'. The 'Details' section contains the following fields: 'Type' is 'Shell on the server (Shell)'; 'Command' is 'cd Automation/Workflows && runw.bat "Cisco Video Quality Metrics" > ...\\..\\vrcisvideoautomation.log'; 'Description' is empty; 'Password Key' is 'PROGNOSIS'. There are 'Build...' buttons next to the 'Command' and 'Description' fields. The 'Node to Run On' section shows 'Command Node' as '#CurrentNode' with an 'Override Default Command Node' checkbox checked.



Credentials from PQL

Retrieve credentials from the Passwords Config

```
pql.getCredentials(key);
```

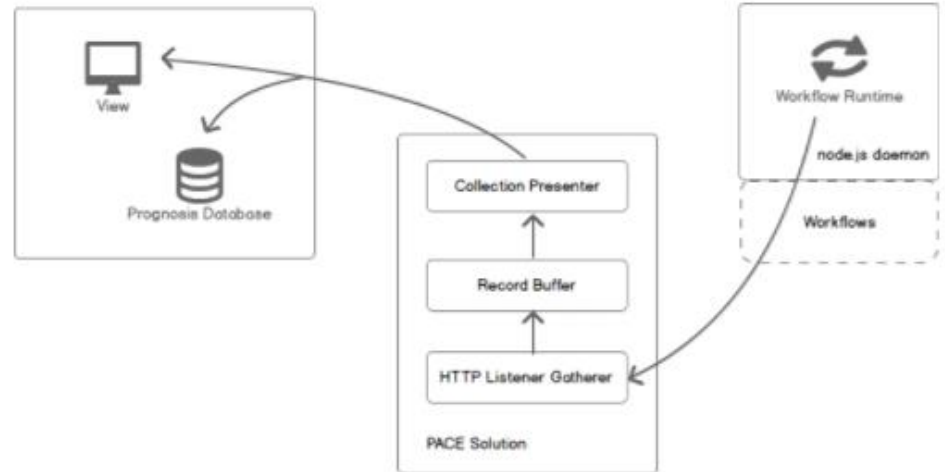
Only entries with AUTOMATION: prefix are accessible



Automation Collector

- Irautomation.exe (pace collector)
- Needs SDN Profile in AUTOMATION conf:

```
DEFINE SDN_PROFILE(Automation,"Url=http://*:1339/AutomationFeed","site=Automation")
```





Troubleshooting

- License Key is present?
- irAutomation is running?
- Check the log file at
C:\Prognosis\WebUI\IIS\Logs\PrognosisAutomationLog.txt
- User has permission to run automation?
- Run from command line and use console logging.



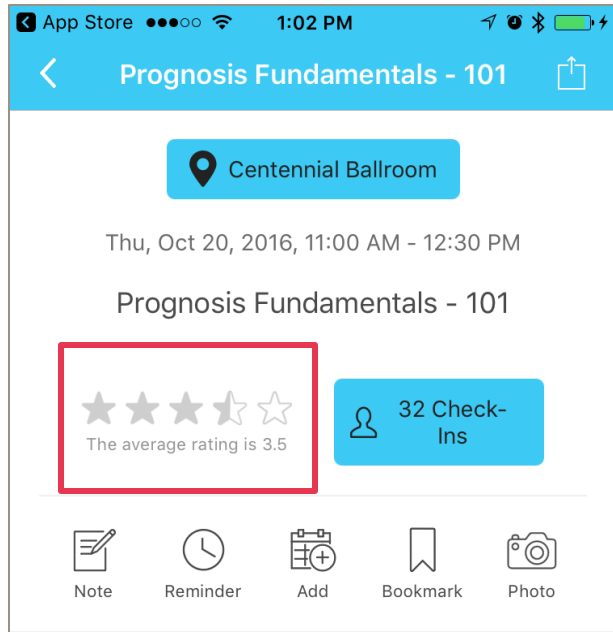
Power Tips

1. Asynchronous I/O, Trace & Crashes
 - assert wrapper to allow trace to be output before crash
2. Run from the console to debug
 - Encapsulated Prognosis Logger to support Console
3. 5 crashes rule
 - Many things could cause irAutomation.exe to crash (esp. logging)
 - Prognosis governor prevents restarting after 5
 - Restart Prognosis for a clean test run
4. Node.js is late bound & error code only runs when errors occur... so make errors to test
5. If the Node.js library is not shipped with Prognosis... you ship it!
6. Test PQL statements first
 - irPQLcli.exe (which must be invoked from the Configuration folder)
7. 2048 byte URL limit
 - Limits on parameters to Workflow (HTTP GET only)
8. Browser console.log
 - Enables F12 debugging



Next Steps

- **Please Rate the Class**
- **Take the Knowledge Reinforcement Test**
- **Log On to Online.Prognosis.com** to download slides & ask questions
- *Every class rating gets you a chance to win prizes!*



Questions?



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