Cortana

Rise of the Automated Red Team

Raphael Mudge
@armitagehacker

Overview

- Background
- Cortana
- Distributed Bots
- Post-exploitation
- Behavior Modification
- User Interface

This work was made possible through DARPA's Cyber Fast Track program.

What this talk is not

- Not a Cortana tutorial
- Some features are skipped entirely
- An exploration of the software agent programming paradigm
  - This is sad
  - Because it is fun
  - ☹

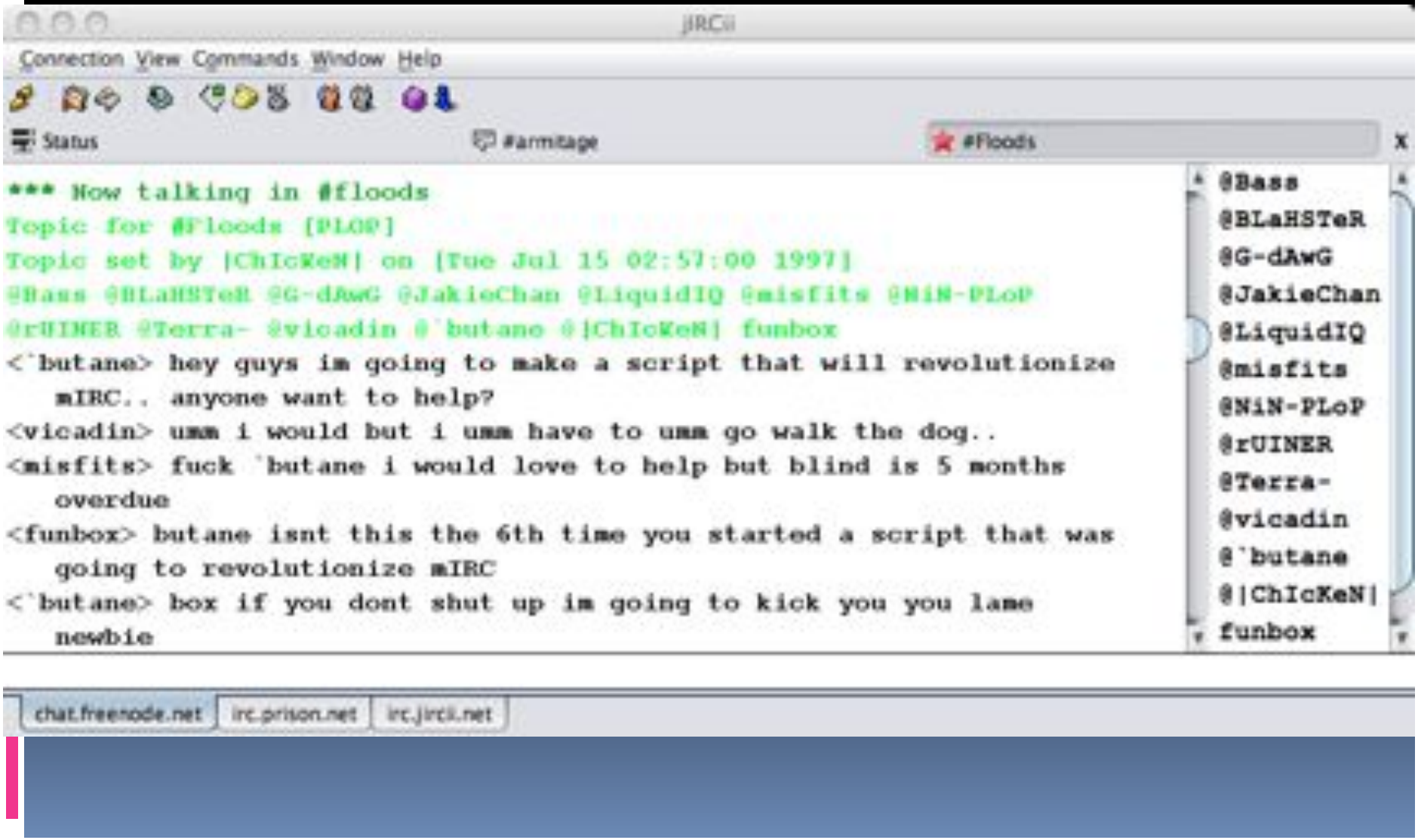
Today's Goals

- Demonstate what Cortana can do
- Cover major functionality
- Encourage you to try it.

Introduction: Raphael Mudge

- Formerly, IRC LaMeR
- Developer, jIRCii IRC Client
- Developer, Sleep Scripting Language
- Developer, Armitage
- Founder, Strategic Cyber LLC

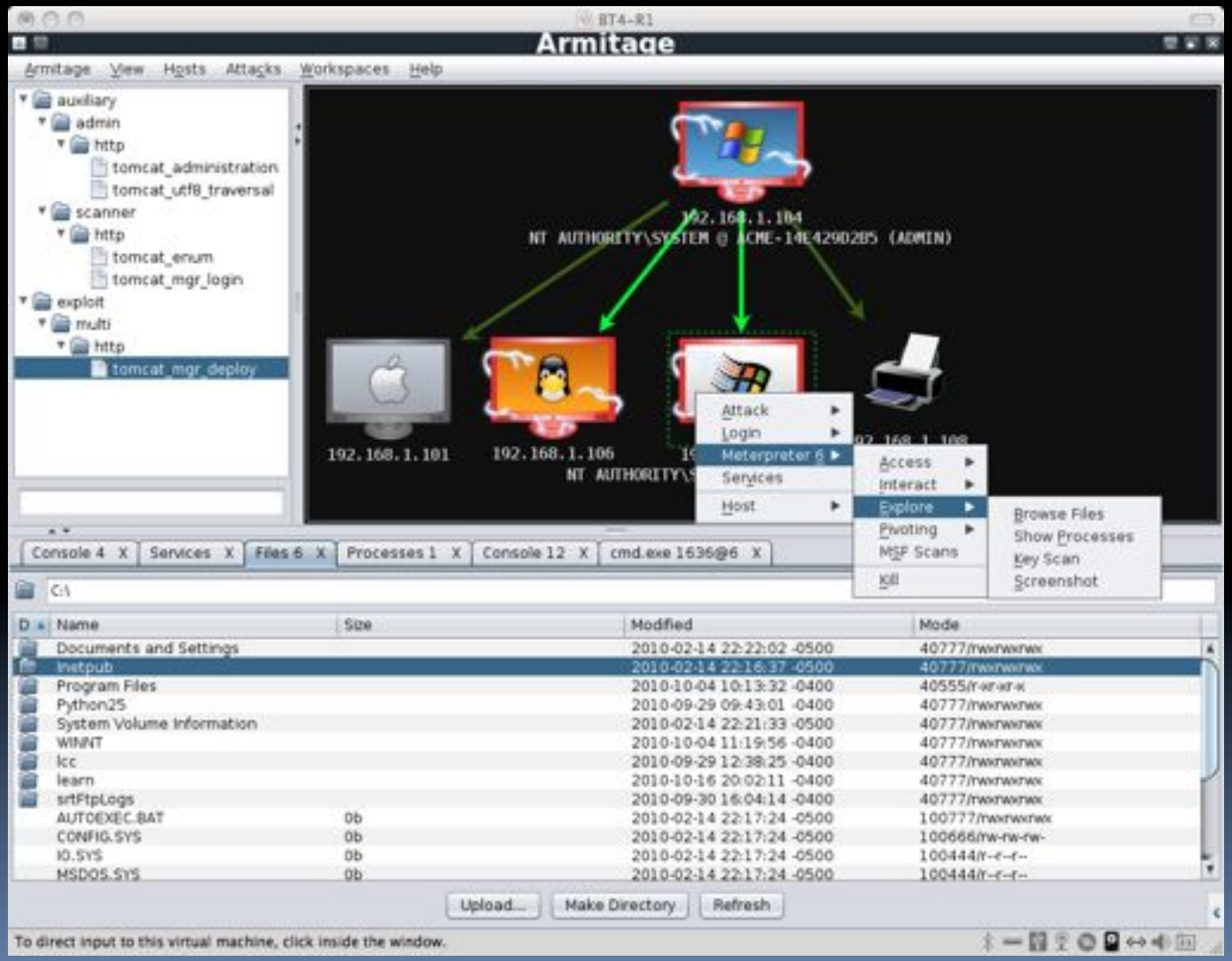
Introduction: jIRCii



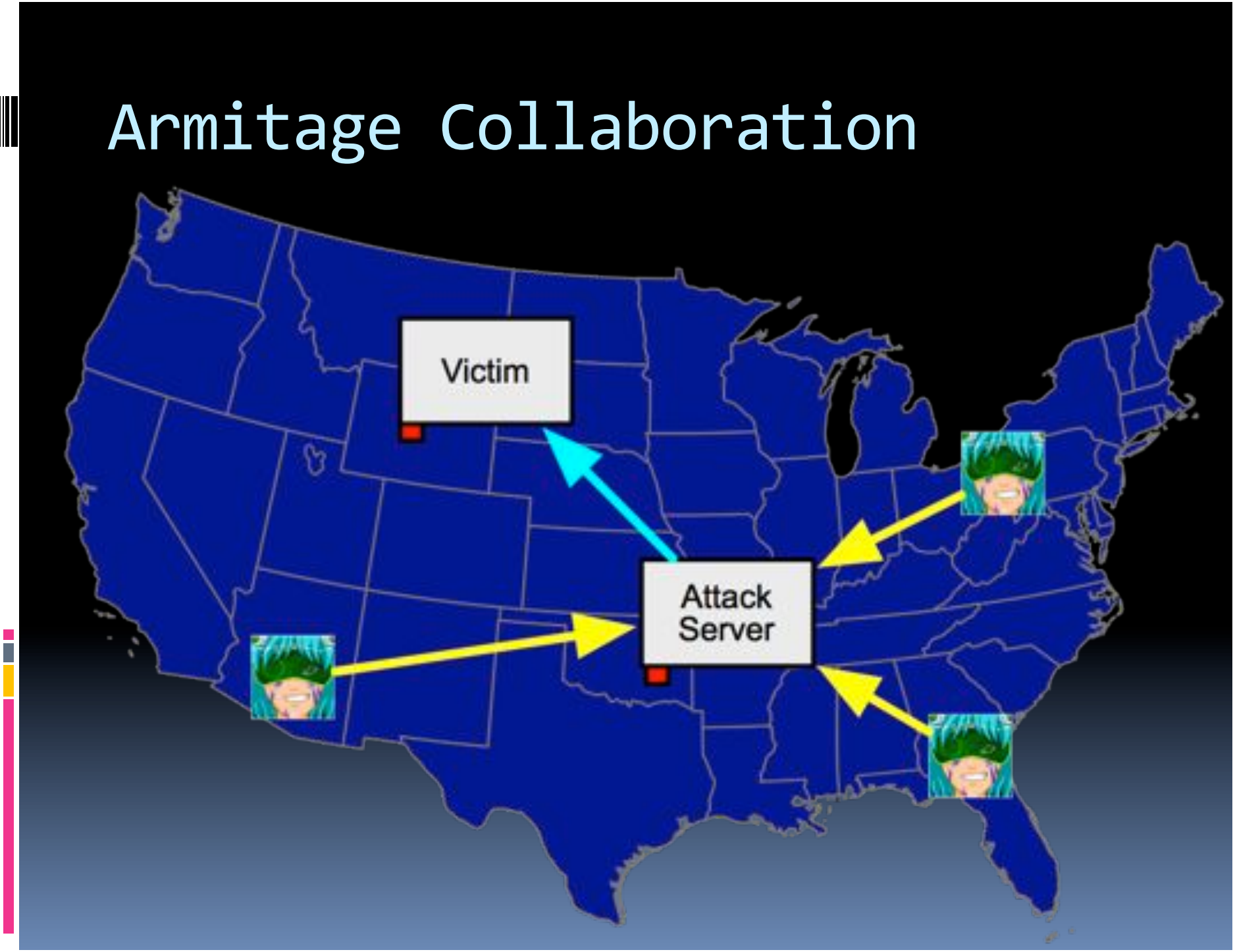
Introduction: Sleep

- Perl inspired syntax
- Built on Java
- Extensible
- Small! (~250KB)
- Embedded in jIRCii

Introduction: Armitage



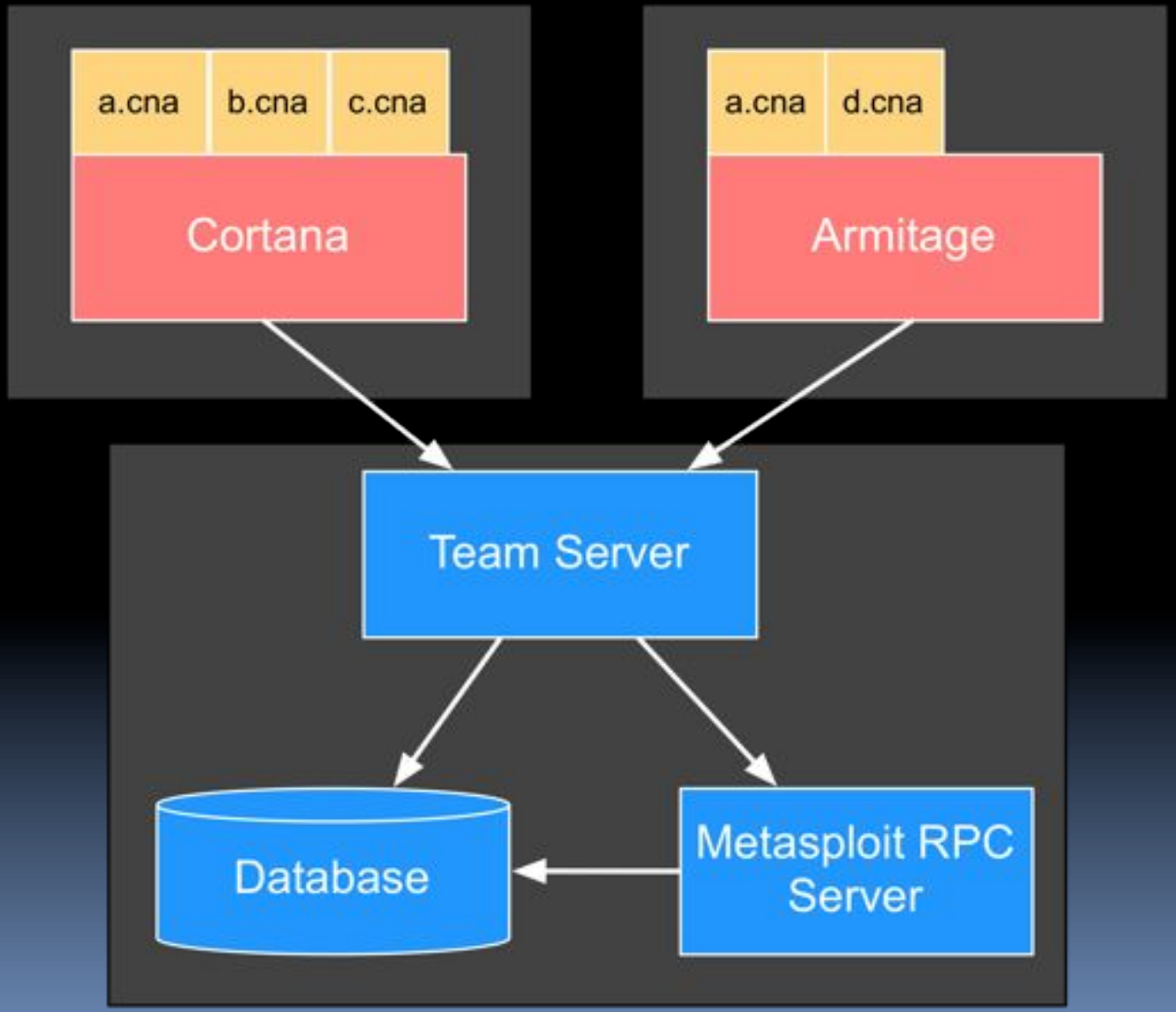
Armitage Collaboration



Cortana: What is it?

- A Scripting Language to:
  - Automate Metasploit Framework
  - Extend Armitage

Cortana: What is it?



The Software Agent Lense…

- Cortana is a domain-specific language to develop "Agents" that conduct cyber operations…
  - Team server provides distributed communication
  - Metasploit offers capabilities and data model
  - Cortana offers means to create long running agents that perceive context and respond to it.
  - Cortana also provides tools to debug, understand, and assure positive control of agents

Cortana: What it does

- Metasploit Control
- Data Management
- Post-Exploitation
- Team Server Participation
- Modify Armitage Behavior
- Extend Armitage User Interface

Cortana: Alternatives

- Extend Metasploit Framework
  - Modules
  - Plugins
  - RC files
- Metasploit RPC Server
- msfcli

Distributed Bots

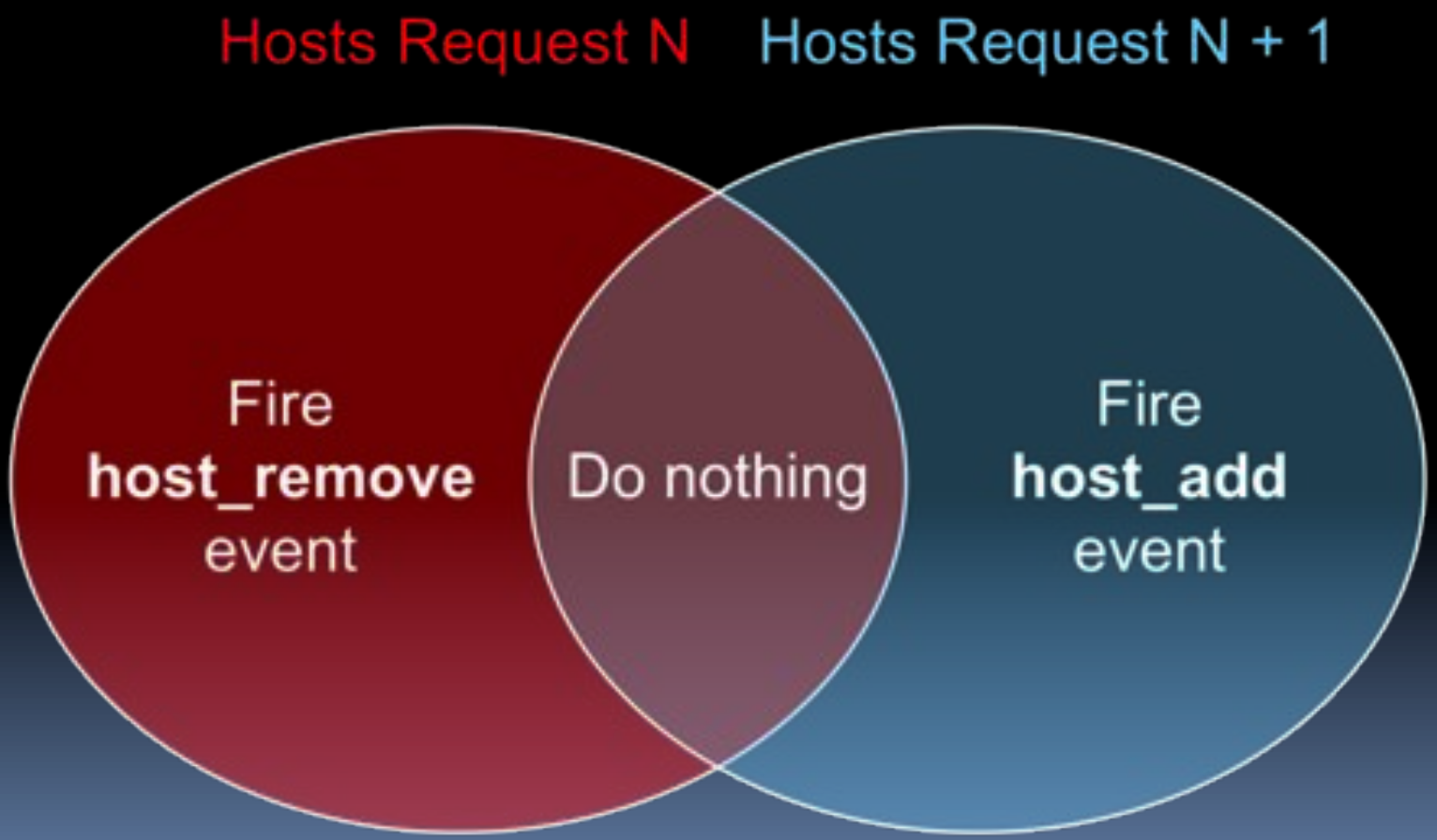
Problem...

- Jolly: It'd be nice if there was a way to know when new hosts/services pop up
- Chris: I'm constantly running scans, I'll put the data where ever you like...
- Me: I think I can help...
- Chris: I don't want to import my scans every minute. Can we automate this?

Background: Event Listeners

```
on event_name {
        # do this stuff
        # $1 = first argument
        # $2 = second argument
        # $n = nth argument
}
```

Data Events

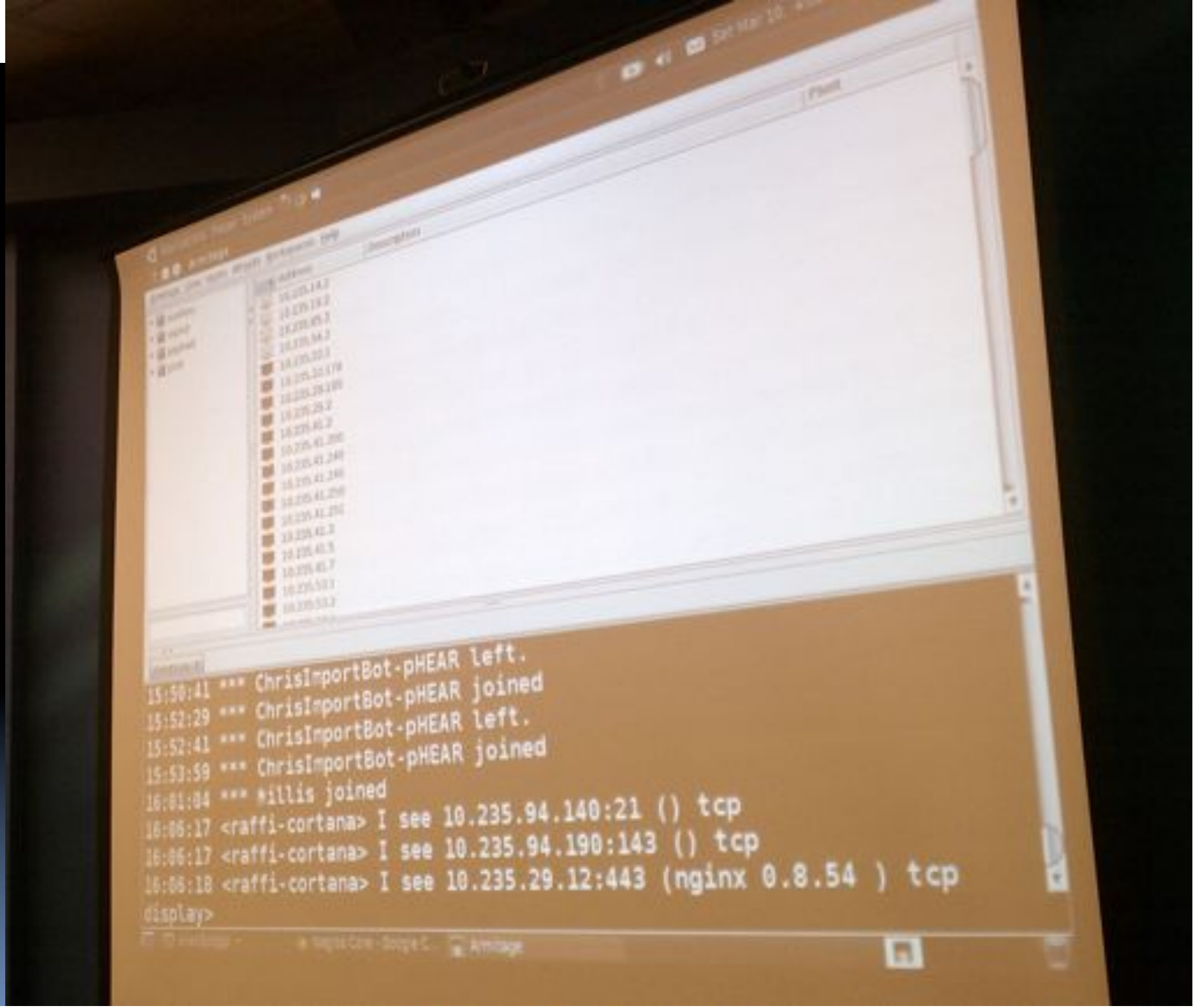

Hosts Request N
Hosts Request N + 1
Fire
host_remove
event
Do nothing
Fire
host_add
event

Data Events

- Credentials
- Hosts
- Loots
- Routes
- Services
- Sessions

Host/Service Notify Bot
Host Import Bot

DEMO


15:50:41 *** ChrisImportBot-pHEAR left.
15:52:29 *** ChrisImportBot-pHEAR joined
15:52:41 *** ChrisImportBot-pHEAR left.
15:53:59 *** ChrisImportBot-pHEAR joined
16:01:04 *** Killis joined
16:06:17 <raffi-cortana> I see 10.235.94.140:21 () tcp
16:06:17 <raffi-cortana> I see 10.235.94.190:143 () tcp
16:06:18 <raffi-cortana> I see 10.235.29.12:443 (nginx 0.8.54) tcp
display>

Post-exploitation

Problem

- I want to control sessions
  - With multiple actors using them
  - With assurance that the script won't lose control

Background

- Interacting with a Meterpreter session:

```
on meterpreter_command {
    # $1 = session id
    # $2 = command and arguments
    # $3 = output
}

m_cmd(session id, “command”);
```

Background

- Interacting with a process through a meterpreter session:

```
on exec_command {
    # $1 = session id
    # $2 = command and arguments
    # $3 = output
}

m_exec(session id, “command”);
```

Background

- Interacting with a Shell session:

```
on shell_command {
    # $1 = session id
    # $2 = command and arguments
    # $3 = output
}

s_cmd(session id, “command”);
```

A cool demo

DEMO

Behavior Modification

Problem

- I want to alter how Armitage does X
  - Use a different payload for certain attacks
  - Integrate a different executable with psexec
  - Modify Armitage icon display

Background

- Filters, hook an action and change the parameters

```
filter some_filter_name {
  # inspect $1, $2, $3, etc.
  return @_;
}
```

Another cool demo

DEMO

User Interface

Problem

- I want to extend Armitage with new features
  - Integrate third-party tools
  - Expose Metasploit Framework features
  - Control Cortana capabilities

Background

- Cortana scripts may:
  - Define keyboard shortcuts
  - Define popup menus
  - Create console tab interfaces
  - Create table interfaces

The last cool demo

DEMO

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Summary

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This work was made possible through DARPA's Cyber Fast Track program.

Where to go from here…

- Twitter: @armitagehacker
- Email: rsmudge@gmail.com

Cortana is posted at:

- WWW: http://www.fastandeasyhacking.com