Preventing Home Automation Security Disasters

James Arlen
SecTor - Toronto - 2015
I am employed in the Infosec industry, and this talk has nothing to do with my job, it’s just neat stuff I fool around with in my spare time.

It’s an hour you’re never getting back. Thanks!
credentials

• 21+ years information security specialist
• Director Risk and Advisory Services with Leviathan Security Group (ask me about jobs)
• Contributing Analyst with Securosis
• staff operations, management, consultant, auditor, researcher, analyst
• utilities vertical (grid operations, generation, distribution)
• financial vertical (banks, trust companies, trading)
• one of those liquidmatrix people 🎵
• founder of think|haus hackerspace - hamilton ontario 🏡

...still not an expert at anything.
Internet of Things
! IoT
but shares some characteristics
Home Automation
Why?
Historically
We’ve been on the search for something better than an upholstered cave for a long time.
Company shocked at a Lady getting up to Ring the Bell.
Meet Edgar.

He'll make you sing,
make you dance,
make you laugh,
make you cry,
make you jealous,
make you nuts.

Electric Dreams
1978

the modern era
BACK TO THE FUTURE
Versatile Wireless Remote Control Systems
Take Command of Lights and Appliances Around Your Home

Remote Control Timer Center Automatically Turns Lights and Appliances On and Off

- Instantly Sends On/Off Commands At the Preset Times
- Just Plug-In—Uses AC House Wiring

Built-in timer automatically controls up to eight electrical conveniences in your home. It can wake you up, make the coffee, turn the radio on, start dinner, turn outdoor lights on and off, much more! Just plug appliances and lights into modules (below), then into AC wall outlet and you're all set. Program each light or appliance to turn on off at the same time each day or vary the times for a more secure "at-home" look. Separate controls let you instantly turn all lights on in emergencies, set the display level, or turn both lights and appliances off. Intermittent power failure protection prevents loss of programmed times. 3"x43⁄4x3" x 33⁄4. U.L. listed. 69.95

Remote Control Center

Mini Remote Control Center 24.95
Small Enough To Place Anywhere—Even Mounts on Wall
Instantly control eight lights or appliances with modules, below: Individual on/off, brighten/dim lights, all lights on, all units off. 11/4x4%3/8. U.L. listed. 61-2677 24.95

Remote Control Center Operates Electrical Conveniences With the Touch of a Button

"Panic Lights" Switch Flashes Lights On and Off to Attract Attention and Scare Away Intruders! 42.95
Enjoy total control of up to 16 lights or appliances throughout your home from one convenient location! Use as many Control Centers and modules (below) as you wish—no special wiring to install. Turn on lights in any room and adjust their brightness. Also remotely control TV, stereo, and appliances. All-On instant switch turns all lights on in emergencies. All-Off controls both lights and appliances. 41/2x31/2x33⁄4. U.L. listed. 61-2676 42.95

Remote Control Modules for Lights, Appliances

Mini Remote Control Center Starter Package 49.95
Puts two lights in your home under remote control. Includes Mini Remote Control Center (61-2677, above) and two Lamp Dimmer Modules (61-2682, right). Add other modules to control appliances and more lights. Controller With Dimmers. Save $8.98. Reg. Separate Items 58.93 49.95

Appliance Module 16.99
Lamp Dimmer Module 16.99
Wall Switch Module 17.99
Wall Outlet Module 17.99
Universal Appliance Module (3-Prong) 21.95

There's a RadioShack Store or Dealer Near You. Wherever You Are.
TRS-80® Color Computer — The Fun Way to Start Computing!

13" Color Video Receiver
399.00

4K Color Computer
399.00

- Displays Vivid Color Graphics — With Sound
- Uses Instant-Loading Program Paks
- Attaches Easily to Any Color Television Set

The TRS-80 Color Computer makes computing fun for the entire family! Just plug in a Program Pak for entertainment, educational or personal uses. Or, with the easy-to-use manual, learn to write your own programs in Color BASIC. Comes with 4000 characters of internal memory (expandable to 32,000), eight colors and a built-in RS-232 interface for easy communications ability. Add a printer, joystick(s), or a modem for telephone communications. Includes manual. U.L. listed. 26-3001...

Dust Cover, 26-3006... 4.95
Color BASIC Instruction Manual, 26-3191... 5.95

TRS-80 Color Video Receiver. A 13" high-resolution TV for brilliant color graphics, easy to read text. Also receives UHF/VHF TV. U.L. listed. 26-3018...

399.00

CTR-80A Cassette Recorder

59.95

Automatic Level Control
Record programs and data on tape for later use. Cable included. U.L. listed AC operation or 4 alkaline batteries (not incl.). 26-1206... 59.95

Our Growing Line of Instant-Loading Color Computer Programs

- Diagnostic ROM. Test memory and functions. 26-3019... 29.95
- Queuer Commander. You're at the controls of a starship, trying to destroy enemy ships. Joysticks required. 26-3051... 39.95
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- Skiing. A downhill race against the clock seen from the eyes of the skier. Simple and complex settings. Joysticks required. 16K recommended. 26-3058... 39.95
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- Color File. Tape-based electronic filing system. Useful in keeping a household items inventory, mailing addresses or anything else that needs to be filed. 26-3103... 29.95
- Typing Tutor. Letter and word drills. Keeps track of words per minute, fast letters, slow letters, errors. 26-3152... 29.95
- Chess. Challenge the "mind" of a thinking machine in this age-old battle of strategy and defense. The computer is always ready for a quick blitz or a slow, thoughtful game. Helps you learn to play or sharpen your skills. 26-3050... 39.95
- Pinball. This classic arcade game has been updated for your Color Computer. Play the built-in version or, if you wish, customize your own game! Provides hours of fun for one to four players. Joysticks required. 26-3052... 29.95
- Super Bustout. A real "break-through!" Use your paddle to deflect the ball to break down the barrier and get out to the other side. Fast-paced fun for one to four players, either on teams or in head-to-head competition. Joysticks required. 26-3056... 29.95
- Dino Wars. Stone age fun! Two players battle it out with dinosaurs. Realistic yelps, growls, trumpeting lout noises. When one dinosaur is bitten on the head or falls down, Joysticks required. 16K recommended. 26-3057... 29.95
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Project Nebula. Your mission is to rid the galaxy of invaders. Four levels of play, including target practice, exchanging fire with aliens, controlling fuel supply and managing a disabled ship. Joysticks required. 26-3063... 39.95

Personal Finance. Designed to help you answer important questions about your finances, and to assist you in setting up a budget. Choose from 26 major expense categories — or make up your own list. 26-3101... 39.95

Bingo Math. Teaches children math the fun way! Addition, subtraction, multiplication, division, number recognition; also helps to improve their response time. For one or two players. Joysticks required. 26-3150... 29.95

Retail Prices in this catalog may vary at individual stores and dealers.
### Home automation

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**See also:** Home of the future · Building automation · Floor plan · Home automation · Home energy monitor · Home network · Home server · House navigation · INTEGRER Millennium House · Ubiquitous computing · Xanadu Houses
technological advances

(mostly radios)
The world’s leading brands are powered by ZigBee Alliance.
SHINY PRODUCTS
Lutron Caséta Wireless Smart Lighting In-Wall Dimmer Kit (HomeKit-enabled)

$269.95

★★★★★

Add to Bag

Delivery:
In Stock
Free Shipping

Need help? Chat Now
BAD ACTORS
Off Topic: Argh! Smart House Went Stupid

Here I am, about 30 hours away from home, and my home automation system is freaking out. Why does stuff like this only happen when I’m on the road? Time to whip out my copy of *How To Prepare For The Robot Uprising*.

I guess I know what I’ll be fixing this weekend…

— Rich

*No Related Posts*
CHANGES LOCKED OUT

** IMPROPER REQUEST **

** ACCESS DENIED **
Rational Survivability

A couple of weeks ago, right after I wrote my two sets of 2008 (in)security predictions (here and here), Mogull informed me that he was penning an article for Dark Reading on how security predictions are useless. He even sent me a rough draft to rub it in.

His Dark Reading article is titled "The Perils of Predictions – and Predicting Peril" which you can read here. The part I liked best was, of course, the multiple mentions that some idiot was going to predict an attack on SCADA infrastructure:

"Oh, and there is one specific prediction I’ll make for next year: Someone will predict a successful SCADA attack, and it won’t happen. Until it does."

So, I’m obviously guilty as charged. Yup, I predicted it. Yup, I think it will happen.

In fact, it already has...

You see, Mogull is a huge geek and has invested large sums of money in his new home and outfitted it with a complete home automation system. In reality, this home automation system is basically just a scaled down version of a SCADA system (Supervisory Control and Data Acquisition.) Controlling sensors and integrating telemetry with centralized reporting and control...

Rich and I are always IM’ing and emailing one another, so a few days ago before Rich left town for an international junket, I sent him a little email asking him to review something I was working on. The email contained a link to my "trusted" website.

The page I sent him to was actually trojanized with the 0day POC code for the QT RTSP vulnerability from a couple of weeks ago. I guess Rich’s Leopard /ip rules need to be modified because right after he opened it, the trojan executed and then phoned home (to me) and I was able to open a remote shell on TCP/554 right to his Mac which incidentally controls his home automation system.

It totally pwns his house.

So a couple of days ago, Rich went out of town and I waited patiently for the 0day article to post. Now that it’s up, I have exacted my revenge.

I must say that I think Rich’s choice of automation controllers was top-shelf, but I think I might have gone with a better hot tub controller because I seem to have confused it and now it will only heat to 73 degrees.

I also think he should have gone with better carpet.

I’m pretty sure his wife is going absolutely bonkers given the fact that the lights in the den keep blinking to the beat of a Lionel Richie song and the garage door opener keeps trying to attack the gardener. I will let you know that I’m being a gentleman and not peeking at the CCTV images... much.

Let this be a lesson to you all. When it comes to predicting SCADA attacks, don’t hassle the Hoff!

/Hoff
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**Let this be a lesson to you all. When it comes to predicting SCADA attacks, don’t hassle the Hoff!**
End Of Year Humor And Awareness: No Folks, Hoff Didn’t Pwn Me

Chris Hoff and I decided to have a little fun and take some back and forth exploits to highlight some security risks. It’s nearing the end of the year; either crunch time for some of you, or boring time for the rest. We figured a little humor couldn’t hurt in either case. We decided to blow this open early so it doesn’t get away from us.

The attack Chris described could clearly work, but I’m surprised more people didn’t pick up the holes. While I do have a home automation system (but no cameras) I don’t know of any that use SCADA-based technologies. Then again, SCADA is going all IP so it might not be a stretch to define my system that way. For the record, I use an Insteon system but haven’t finished implementation yet.

Bonus points to the commenters that noticed there’s no way I’d have a yard with that much green in Phoenix.

The idea of the Quicktime rtsp attack was completely real. Until Apple released the patch a day or so ago, the only defense was avoiding clicking on potentially hostile links. I trust Chris, and would click on most things he sends me. Outbound filtering (which I do one one of my machines) could block the request unless it directed me to an unusual port; something Chris is capable of.

The idea of pwning my workstation is dead on- and one reason I often recommend SCADA workstations be isolated from the Internet. I don’t have to take over your SCADA network if I can take over the workstation and do whatever I want when you aren’t looking.

We were planning on highlighting a few other attack vectors in the next few days. Among them was a fake pretexting of Chris’s phone (we had a viable way for me to get his SSN) and username/password sniffing from wireless access points. All are common vectors that even us security pros are a little lax with sometimes.

I suspect most of you enjoyed this, and we’ll come up with something more creative for April 1.

—Rich
Noke: The Smartest Lock Ever Made

Noke: End the frustration of losing keys and forgetting combinations forever. Noke is the smartest padlock ever made. Know who, when and where your lock was used.

Order Yours

Created by
FÜZ Designs

6,108 backers pledged $652,828 to help bring this project to life.
The Future of Smart Homes - B.One

Future Proof your home with B.One Smart HUB

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535 backers pledged $109,893 to help bring this project to life.
Hook: Home Automation on a Budget

Hook lets you control remote controlled outlets and bulb sockets with your phone and IFTTT! We are accepting Pre-orders on Indiegogo. Check it out!

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An affordable smart home-automation solution. Monitor and save energy, remote access via Android and iPhone. Worldwide compatibility.

Pre-order

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316 backers pledged $107,516 CAD to help bring this project to life.

abode is a home security and automation company that offers a self-installed, professional-grade solution with no contracts.

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abode

470 backers pledged $152,604 to help bring this project to life.
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Thinking about using Arduino to automate your home? Do it easily with our compatible board!

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Imagine putting together home automation projects with easy to use DIY open source modules that save energy and make life awesome.

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airfy Beacon - imagination meets smart home automation

Make your home interactive and let your imagination take over. The airfy Beacon brings you affordable smart home automation!

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Wattvision is a revolutionary sensor and app that gives you real-time feedback on your energy use so you can save money and the planet.

Created by

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487 backers pledged $67,292 to help bring this project to life.
cheap Shenzhen electronics
Kankun K2 Wifi Smart Plugs Socket Wireless Switch with Remote Control EU/US Power Socket Black/White

Price: $24.65 - 83.45 / Piece
Min Order: 1 Piece
Sold: 66
Shipping: 10 - 15 days

Add to Cart

HOT Kankun K2 Wifi Smart Plugs Socket Wireless Switch with Remote Control EU/US Power Socket Black/White

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Wholesale Smart Socket Online WiFi Wireless Plug Socket

Price: $17.81 - 23.46 / Piece
Min Order: 1 Piece
Sold: 8
Shipping: 10 - 15 days

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2015 Orvibo EU,US,UK,AU Standard Power Socket WiFi Smart Switch Travel Plug Socket Home Automation app for Iphone Ipad Android Smartphones

Price: $18.96 - 20.77 / Piece
Min Order: 1 Piece
Sold: 6
Shipping: 10 - 15 days

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Intelligent Socket Online WiFi Wireless Switch for Smart Home Automation

Price: $22.06 - 27.82 / Piece
Min Order: 1 Piece
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762 items found for wifi light bulb

Related Keywords: led cool white 15w, e27 led 10 color, led home lights 220 240v, 110v 15w e14 light bulb

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Sort by: Best Match

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Free International shipping
5% off

Cell Phone Remote Control Wireless WiFi Smart AC Power Socket Switch Plug Outlet
$21.39 From China
Buy It Now
Free International shipping
33 sold
ACTUAL PROBLEMS
internet is down
developer fail
Quirky ‘Terribly Embarrassed’ Over Wink Home Automation Hub Recall (Updated)

The bad news: The Wink home automation hub from Quirky is being recalled because the company failed to update its security software. The good news: The security worked!

By Julie Jacobson, April 20, 2015

Updated 4/20/2015 with progress report from Wink. Skip to the bottom of the article.

On April 18, Wink said it was “doing a bit of work on our end so if you see any devices offline we’ll get you back up and running shortly,” the home automation division of GE-backed Quirky announced on Twitter.

We now know that Wink originally had done its customers a favor by including a security certificate in the hubs, but that certificate expired exactly one year after Wink shipped the hubs. Without a valid security certificate, the hubs were unable to connect to the Internet—not a good thing for a cloud-based smart home system.

“We’re terribly embarrassed by this whole situation,” Wink emailed to users. “This outage was completely preventable and caused by a security measure that was put in place to protect you and your family. Unfortunately we failed to make an update to a security measure that was expiring, and therefore locked down your Hub’s access to the server.”

There is no way to update the security software remotely because the existing security software in the hubs won’t allow them to connect to the Web ... for security reasons. (Update: Wink tells techies they can http://recovery.wink.com/?title=do+it+themselves>do it themselves if they’re comfortable enough to change DNS settings.)

“To cut to the chase,” Wink tells users, “We need your Wink Hub back. We’ll update it and get it back to you within a few days. We’ve done all we can to make the process as simple as possible.”
insurance companies
GOT NEST? SOME INSURANCE COMPANIES REWARD SMART-HOME DEVICE OWNERS

By Jenny McGrath — January 25, 2015
mission creep
ACTUAL SOLUTIONS
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Parental Controls
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24/7 Tech Support
Call or chat with us any time. Our agents are here to help walk you through your technical issues so you can get...
stop selling to the bottom
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<td>$22.99</td>
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<td>*Save up to $1.44 additionally for online ship out orders!</td>
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ISP
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Manufacturing
Regulatory
You
Consumer
Un-interrupted
Power
Supply
ISP
Consumer
Manufacturing
Regulatory
You
Manufacturing
“Sunny Day” mode
software quality
Boffin's easy remote hijack hack pops scores of router locks

Singaporean telco's customer premises equipment is a gateway to security hell

11 Oct 2015 at 22:58, Darren Pauli

Thousands of routers mandated for use by a major Singaporean telco and operated by "top enterprises" around the world are open to a remote zero day exploit that allows routers to be completely hijacked and is indefensible by most users.
ISP
Consumer
Manufacturing
Regulatory
You
Regulatory
testing of both hardware and software
mandated MTTF for software defects*

* stop calling defects “vulnerabilities” dammit
easy lookup* of regulatory and recall status
including manuals and firmware upgrades
ISP
Consumer
Manufacturing
Regulatory
You
IPv6
IPv6 Security
Awareness Training
we’re screwed
all of these potential solutions are...
...haaaaaaaaaaaaaaaa
aaaaaaaaaaaaaaaaaaa
aaaaaaaaaaaaaaaaaaa
aaaaaaaaaaaaaaaaaaa
aaaaaaaaaaaaaaaaaaa
aaaaaaaaaaaaaaaaaaa
aaaaaaaaaaaaaaaaaaa
aaaaaaaaaaaaaaaaaaaard
sorry
Q & A

twitter: @myrcurial
work: james.arlen@leviathansecurity.com
not work: myrcurial@myrcurial.com

Credits, Links and Notices

Thanks:
All of you, My Friends, My Family
Brian, Bruce and the rest of the SecTor team.

Colophon:
twitter, wikipedia, fast music, caffeine, my lovely wife and hackerish children, blinky lights, shiny things, angst, modafinil & altruism.

Me:
http://securosis.com  http://leviathansecurity.com

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Many presenters who’s work I’ve sampled both for good and bad reasons

http://creativecommons.org/licenses/by-nc-sa/2.5/ca/