## Problem Statement

- The home automation market is growing, however current solutions do not scale and lack flexibility
- Devices on the market lack any security functionality
- SERVANT addresses these shortcomings through a new protocol and dynamic device configuration
- Solution supports extensibility

## Home Security System

- Monitors door positions, motion detectors, and CO Sensors
- Gives user pan-tilt control over a surveillance camera where some basic image and video processing is performed
- Integrated with the routing system
- Detects power outages and enters a battery save mode

## Power Strip

- Power Strip has surge protection, and is rated to 15 Amps
- Provides control of 6 individual sockets, in addition to monitoring each one for power consumption
- Provides user with two USB ports for charging

## Utilities

- Gives user control of 8 sprinkler zones
- Uses data from both a moisture sensor and online weather services to detect moisture levels and ensure conservation of water in the event of rain
- Allows for flexible and customizable scheduling schemes to ensure the customer’s satisfaction
- Leverages both heat index and temperature for climate control
- Supports medium size (residential) HVAC unit

## Secure Protocol

- Provides a secure network, with packet inspection to enable virtualized trust boundaries
- Built on Elliptic curves with prime fields to maximize strength / key size
- Requires no assumption of internet connectivity for one device
- One time cost to establish a secure connection
- Symmetric keys are derived from asymmetric information so faster encryption algorithms can be leveraged

## Prototype

![Prototype Image]

## Conclusions

- SERVANT is a platform capable of delivering a comprehensive yet customized home automation solution
- Delivers cost effective functionality in home security, power, irrigation and HVAC
- Only system of its kind with robust security