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# **IoT Security: ROI Model Guide**

*A custom Heavy Reading report produced for Radware*



**AUTHOR: JIM HODGES, CHIEF ANALYST, HEAVY READING**

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## 1. INTRODUCTION

There is little – if any – debate that Internet of Things (IoT) services will become a staple of the services landscape. Given the broad range of applications possible, from narrowband basic monitoring and tracking services to high band, ultra-low latency services, including autonomous vehicles, the revenue opportunities are also diverse.

However, one characteristic that is common to all IoT services is the need to ensure that devices and the data they generate are protected from threat vectors. As a result, communications service providers (CSPs) are adding IoT security services to their already expanding portfolio of cloud-based managed security services.

In order to assist CSPs with their rollout of IoT security services, Heavy Reading, in collaboration with Radware, developed a modeling tool designed to quantify the financial and return on investment (ROI) fundamentals of IoT security services. This report provides a detailed overview of the model with a focus on the steps and inputs necessary to model cost versus cash generation on a per-scenario basis.

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## 2. IoT SECURITY ROI MODEL OVERVIEW

Given the diverse range of IoT services noted above, the model created was designed with the greatest level of flexibility possible. It utilizes a number of distinct modules to estimate IoT device penetration and traffic generation. These modules also estimate operational costs, including general sales and administrative/marketing, as well as the capital equipment essential to support service launch.

They include the following:

- Module 1: Market Sizing
- Module 2: Capacity Planning
- Module 3: Capital Expenditure Requirements
- Module 4: Operating Expense Requirements
- Module 5: Revenue Generation and Net Cash Flow

### 2.1 Module 1: Market Sizing

The logical starting point for any service launch is to model the anticipated market penetration the service will attain in a current + 5-year window.

In order to capture which service is being modeled, the first step is to input the type of service being modeled and the addressable market assumed. Input cells necessary to model a specific service scenario in all modules are captured using mustard colored cells

*Please note that the inputs utilized in this guide are provided for illustrative purposes to document model design methodology and scenario creation steps; they are not to be interpreted as market-validated inputs.*

For example, as shown in **Figure 1**, this scenario assumes a narrowband IoT security service utilizing a monthly plan pricing capacity-based module with a total addressable market of 1 million devices.

**Figure 1: IoT Scenario Description**



Source: Heavy Reading

The next step in the modeling process is to estimate market penetration and total market sizing for the current + 5-year period.

As shown in **Figure 2**, the inputs into the market sizing module capture a very gradual growth on a market base of 1 million devices. The first step is to input the current year (in this case, 2019). Once this is done, the 5-year future years are automatically input. All these dates are also automatically input into the other section modules. The next step requires the input of the addressable market being targeted (in this case, 1 million devices). After this, growth assumptions are input.

As shown in the figure, in the current year, there is no market growth (100% depicts no growth). In future years, the market is assumed to grow at variable rates (e.g., 10% in 2020, 20% in 2021, 20% in 2022, 15% in 2023, and 20% in 2024).

The fourth input range in this module captures market penetration. For example, as shown in **Figure 2**, the module assumes that only 15% market penetration is attained in the current year with a gradual ramp up to 30% by year 2024.

**Figure 2: Market Sizing Module**

				Current Year					
				2019	2020	2021	2022	2023	2024
Market Sizing				2019	2020	2021	2022	2023	2024
Estimated Number of Devices				1,000,000	1,000,000	1,100,000	1,320,000	1,584,000	1,821,600
YoY Growth				100%	110%	120%	120%	115%	120%
Addressable market				1,000,000	1,100,000	1,320,000	1,584,000	1,821,600	2,185,920
IoT Market Penetration				15%	17%	18%	20%	26%	30%
Net Market Devices				150,000	187,000	237,600	316,800	473,616	655,776
Net Year of Year Device Growth				150,000	37,000	50,600	79,200	156,816	182,160

Source: Heavy Reading

## 2.2 Module 2: Capacity Planning

The next step in the modeling process is to estimate the network capacity these narrowband IoT (NB-IoT) devices will generate. This is necessary because many CSPs are starting to charge for security services based on device consumption patterns.

As shown in **Figure 3**, since this is a narrowband scenario, the device capacity is estimated as only 1 Mbps per device per month. This results in modest capacity requirements of only 1,800,000 Mbps in 2019 growing to 7,869,312 Mbps in 2024 as market penetration increases (see **Figure 2**).

**Figure 3: Device Capacity Planning**

				Current Year Total Capacity (Mbps)					
				2019	2020	2021	2022	2023	2024
Capacity Planning	Device Capacity per Month	Number of Months	Total Capacity Per Year (Mbps) Per Device	2019	2020	2021	2022	2023	2024
Average IoT Device Mbps Capacity per Month	1								
IoT Mbps Security Service Total Capacity		12	12	1,800,000	2,244,000	2,851,200	3,801,600	5,683,392	7,869,312

Source: Heavy Reading

## 2.3 Module 3: Capital Expenditure Requirements

In the third module, capital expenditure (capex) costs associated with equipment purchase and other related costs are estimated. As shown in **Figure 4**, this is accomplished utilizing a two-step process. The first step requires the input of the cost of capex per Mbps (in this case, Heavy Reading utilized \$3.00 per Mbps). This input is captured by sizing the overall market and estimating the software and hardware costs associated with meeting the Mbps demand curve.

The second step involves the input of a growth capex ratio per year to capture the cost of deploying additional equipment to cover growth. Since this scenario captures relatively low capacity growth and gradual market penetration, zero growth (0%) is assumed for all years.

**Figure 4: Capex Requirements**

Capex Investment Cost		2019	2020	2021	2022	2023	2024
Hardware and Software - Net Cost (fully discounted) Cost Per Mbps	\$3.00	\$5,400,000	\$6,732,000	\$8,553,600	\$11,404,800	\$17,050,176	\$23,607,936
Expansion Hardware and Software Capex Ratio		0%	0%	0%	0%	0%	0%
Expansion Hardware and Software Capex Cost		\$0	\$0	\$0	\$0	\$0	\$0
Total Capex Cost per Year		\$5,400,000	\$6,732,000	\$8,553,600	\$11,404,800	\$17,050,176	\$23,607,936

Source: Heavy Reading

## 2.4 Module 4: Operating Expense Requirements

Once the cost of equipment has been captured, the next step is to model and estimate the operational expenses (opex). These expenses are associated with not only monitoring the new network infrastructure, but also the sales and general administrative (SGA) costs to ramp up marketing and sales initiatives.

As shown in **Figure 5**, this is accomplished utilizing a two-step process. The first step, as illustrated, involves estimating the opex associating with network monitoring and admin. In this model scenario, a 20% of capex rate is estimated.

The second step involves calculating the per-year SGA costs. In this case, a per-year ratio approach is utilized (in this scenario, 15% for all years is assumed). The one major difference is that SGA ratio costs are estimated based on revenue, not capex (see **Figure 6**), since these are variable costs that must be managed on a per-year, per-market initiative basis.

**Figure 5: Opex Requirements**

Opex Cost		2019	2020	2021	2022	2023	2024
Opex - Monitoring and Network Admin - Percentage of Capex	20%	\$1,080,000	\$1,346,400	\$1,710,720	\$2,280,960	\$3,410,035	\$4,721,587
SGA Opex Cost (% of total revenue)		15%	15%	15%	15%	15%	15%
SGA Opex Cost		\$14,218,380	\$17,680,580	\$22,465,814	\$29,957,939	\$44,798,642	\$62,018,398
Total Opex		\$15,298,380	\$19,026,980	\$24,176,534	\$32,238,899	\$48,208,677	\$66,739,985

Source: Heavy Reading



It is also important to note that although the onboarding fee could be applied in both pricing scenarios, for simplicity purposes, Heavy Reading has assumed that this fee has not been applied (in both cases).

**Figure 7: Revenue Generation – Annual or Monthly Fee Billing and Cash Flow**

Revenue Projections / Pricing Models for Security Services Only				2019	2020	2021	2022	2023	2024
Capacity Planning									
	Cost Per Mbps	Number of Months							
Average IoT Device Security Cost per Month	\$0.00	12	% Overage traffic	\$0	\$0	\$0	\$0	\$0	\$0
Overage charge Security Traffic Cost per Month	\$0.00	12	0.00%	\$0	\$0	\$0	\$0	\$0	\$0
Device Per Month Fee	\$3.00	12		\$5,400,000	\$6,732,000	\$8,553,600	\$11,404,800	\$17,050,176	\$23,607,936
Device setup - one time onboarding charge	\$0.00			\$0	\$0	\$0	\$0	\$0	\$0
Device Annual Fee	\$12.00			\$1,800,000	\$2,244,000	\$2,851,200	\$3,801,600	\$5,683,392	\$7,869,312
<b>Total Revenue</b>				<b>\$7,200,000</b>	<b>\$8,976,000</b>	<b>\$11,404,800</b>	<b>\$15,206,400</b>	<b>\$22,733,568</b>	<b>\$31,477,248</b>
<b>Total Capex</b>				<b>\$5,400,000</b>	<b>\$6,732,000</b>	<b>\$8,553,600</b>	<b>\$11,404,800</b>	<b>\$17,050,176</b>	<b>\$23,607,936</b>
<b>Total Opex</b>				<b>\$2,160,000</b>	<b>\$2,692,800</b>	<b>\$3,421,440</b>	<b>\$4,561,920</b>	<b>\$6,820,070</b>	<b>\$9,443,174</b>

Source: Heavy Reading

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Heavy Reading  
P.O. Box 1953  
New York, NY 10156  
Phone: +1 212-600-3000  
[www.heavyreading.com](http://www.heavyreading.com)