

THE STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION

_____)	
Rural Carriers of the New Hampshire)	
Telephone Association's Petition for)	
Investigation into the Regulatory Status)	Docket No. DT 09-044
of IP Enabled Voice Telecommunications)	
Service)	
_____)	

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Comcast Phone of New Hampshire, LLC ("Comcast Phone") on behalf of itself and its affiliates, respectfully files the following responses to the NHTA First Set of Data Requests in the above-captioned proceeding.

OBJECTIONS

Comcast hereby reiterates, and incorporates by reference, its Objections to the NHTA First Set of Data Requests filed on November 2, 2009.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-1a

Witness: Beth Choroser

REQUEST:

In its testimony at page 4, lines 12-13, Comcast states that it “has built its network entirely with its own risk capital, and without any rate-of-return guarantees or universal service fund subsidies.”

Please list any service territories or geographical areas in New Hampshire in which Comcast is required to provide CDV or BCV to all businesses and residences, regardless of location.

...

RESPONSE:

Subject to Comcast's objections filed November 2, 2009: None.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-1b

Witness: Beth Choroser

REQUEST:

In its testimony at page 4, lines 12-13, Comcast states that it “has built its network entirely with its own risk capital, and without any rate-of-return guarantees or universal service fund subsidies.”

...

Please list any service territories or geographical areas in New Hampshire in which Comcast is required to obtain regulatory approval of its rates for CDV or BCV services.

...

RESPONSE:

Subject to Comcast's objections filed November 2, 2009: None.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-1c

Witness: N/A

REQUEST:

In its testimony at page 4, lines 12-13, Comcast states that it “has built its network entirely with its own risk capital, and without any rate-of-return guarantees or universal service fund subsidies.”

...

Of the amounts spent on the Comcast network in New Hampshire, what portion was spent on facilities that are also used or useful in providing Comcast's franchised cable television service?

...

RESPONSE:

Comcast objects to this data request as stated in its objections filed November 2, 2009.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-1d

Witness: Beth Choroser

REQUEST:

In its testimony at page 4, lines 12-13, Comcast states that it “has built its network entirely with its own risk capital, and without any rate-of-return guarantees or universal service fund subsidies.”

...

Are any of the facilities used for CDV or BCV service also used to provide Comcast's franchised cable television service? If so, what steps has Comcast taken, if any, to ensure that monopoly cable television service does not subsidize the CDV or BCV service?

RESPONSE:

Yes. Comcast objects to the remainder of this data request as stated in its objections filed November 2, 2009.

Without waiving those objections, Comcast notes that its cable television franchises are not exclusive. *See* N.H. RSA 53-C:3-b; 47 U.S.C. § 621(a)(1).

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-2

Witness: Beth Choroser

REQUEST:

Regarding Comcast's testimony at page 4, line 14 through page 5, line 2, please clarify whether and how Comcast's future level of investment in New Hampshire and its contributions to New Hampshire charitable organizations are dependent on the outcome of this proceeding.

RESPONSE:

As the FCC has noted, the demand for VoIP services encourages broadband investment. *See In the Matters of IP-Enabled Services E911 Requirements for IP-Enabled Service Providers*, First Report and Order and Notice of Proposed Rulemaking, WC Docket Nos. 04-36 and 05-196, FCC 05-116, ¶ 31 (Rel. June 3, 2005). The level of regulation currently imposed on interconnected VoIP providers (no state regulation and minimal federal regulation) encourages Comcast's continued investment in its broadband infrastructure. Moreover, the overall economic health of Comcast is what permits Comcast to continue its commitment to New Hampshire investment, including its facilities and charitable organizations.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-3

Witness: Beth Choroser

REQUEST:

In its testimony at page 7, lines 13-18, Comcast states that its local terminating compensation arrangements with LECs other than FairPoint are on a bill and keep basis. Are these arrangements documented in writing with any of the ILECs in New Hampshire other than the TDS? If so, please provide copies of such Documents.

RESPONSE:

No.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-4a

Witness: David J. Kowolenko

REQUEST:

In its testimony at page 8, lines 14-16, Comcast states that CDV and BCV customers use the last mile broadband facilities provided by Comcast's locally franchised cable television operating affiliates.

What bandwidth is required for a single VoIP call?

...

RESPONSE:

A single CDV or BCV call requires a minimum of 90 kilobits per second. However, Comcast does not offer any CDV or BCV service that is limited to making single calls without other features. CDV and BCV are feature-rich service offerings using varying amounts of bandwidth based on the number of features being invoked at any given moment (such as simultaneous calls, or use of the SmartZone™ web portal).

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-4b

Witness: David J. Kowolenko

REQUEST:

In its testimony at page 8, lines 14-16, Comcast states that CDV and BCV customers use the last mile broadband facilities provided by Comcast's locally franchised cable television operating affiliates.

...

What encoding protocol is used for the VoIP calls (i.e., G.711, G.728, G.729 or other)?

...

RESPONSE:

No "encoding protocol" is used. G.711 is the CODEC used.

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-4c

Witness: David J. Kowolenko

REQUEST:

In its testimony at page 8, lines 14-16, Comcast states that CDV and BCV customers use the last mile broadband facilities provided by Comcast's locally franchised cable television operating affiliates.

...

Can a Comcast customer use an independent third party broadband connection to originate and terminate CDV or BCV calls?

RESPONSE:

No.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-5a; 1-5b

Witness: N/A

REQUEST:

On page 9, lines 7-9 of its testimony, Comcast states that it “works closely with the Public Utilities Commission’s Consumer Affairs Division to ensure that any customer complaints or escalations are appropriately handled.”

Regarding customer complaints for CDV service, does Comcast believe that it is legally obligated to respond to PUC complaints?

If so, under what law?

...

RESPONSE:

Subject to Comcast’s objections filed November 2, 2009: No.

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No: NHTA-Comcast 1-5c

Witness: Beth Choroser

REQUEST:

On page 9, lines 7-9 of its testimony, Comcast states that it “works closely with the Public Utilities Commission's Consumer Affairs Division to ensure that any customer complaints or escalations are appropriately handled.”

...

If not, is Comcast's willingness to respond to PUC complaints permanent; i.e., would Comcast still respond to PUC complaints regardless of the outcome of this proceeding?

RESPONSE:

Yes.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-6

Witness: Beth Choroser

REQUEST:

Regarding the Comcast testimony at page 9, lines 14-15, does Comcast calculate its USF contributions based on jurisdictional traffic studies, or does it use the FCC safe harbor percentage?

RESPONSE:

Comcast uses an allocation methodology to calculate its USF contributions. The FCC has not resolved whether such allocation methodologies constitute "traffic studies."

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-7

Witness: David J. Kowolenko

REQUEST:

In its testimony at page 16, lines 13-22, Comcast refers to DNS databases. Do these DNS database servers belong to third parties, or are they within the Comcast network?

RESPONSE:

The DNS databases referenced on page 16, lines 13-22 of Comcast's testimony are within the Comcast network.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-8

Witness: David J. Kowolenko

REQUEST:

Please confirm that Comcast does not currently allow customers to purchase their own eMTAs for use with their CDV or BCV service in New Hampshire.

RESPONSE:

Comcast does not currently offer eMTAs for customer purchase with CDV or BCV in New Hampshire. Comcast, however, anticipates giving customers the option to purchase their own eMTAs in New Hampshire and other Comcast markets in the near future.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-9

Witness: David J. Kowolenko

REQUEST:

Regarding the Comcast testimony at page 17, fn. 13, please provide examples of instances when the eMTA is not located inside the customer's premises, with a description of the eMTA location.

RESPONSE:

For some BCV customers located in commercial buildings, Comcast may install the eMTA in a shared telephone room or similar space at the customer location, rather than inside of the customer's retail or office premises.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-10

Witness: David J. Kowolenko

REQUEST:

Regarding the Comcast testimony at page 17, lines 6-17, is the eMTA powered by the network or is it wholly dependent on power at the customer's premises? If more than one option exists, please provide a description of each option and its prevalence.

RESPONSE:

The eMTA relies on power at the customer's premises and includes a battery backup in the event such power is disrupted. It is not powered by the network.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-11

Witness: David J. Kowolenko

REQUEST:

Please list in detail and explain in detail each and every function of the eMTA device.

RESPONSE:

Please refer to Comcast's Responses to Data Requests Staff 1-5 and Staff 1-8, filed August 21, 2009.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-12

Witness: David J. Kowolenko

REQUEST:

Please provide a representative sample of the specifications of eMTA devices utilized for New Hampshire residential customers and, if different, for business customers.

RESPONSE:

A representative sample of such specifications is being provided as attachment A hereto.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-13

Witness: David J. Kowolenko

REQUEST:

In its testimony at page 17, lines 11-13, Comcast states that “the eMTA is the device that formats the analog voice signals created by the handset into the IP packets for routing on the Comcast network.” Please state the differences, if any, between such “formatting” and a protocol conversion.

RESPONSE:

Subject to Comcast's objections filed November 2, 2009:

The formatting of analog voice signals into IP packets does not constitute a protocol conversion. A protocol consists of a hierarchy or set of rules that govern the format of the messages and data that are exchanged. As defined by Newton's Telecom Dictionary, a “protocol” is “a specific set of rules, procedures or conventions relating to format and timing of data transmission between two devices.” The transmission of the analog signal from the handset to the eMTA is not governed by such a specific set of rules, procedures or conventions, and the formatting of the analog signal into IP packets therefore does not constitute a protocol conversion.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-14

Witness: David J. Kowolenko

REQUEST:

In its testimony on page 20, lines 10-12, Comcast refers to a "vendor." Who is the vendor, and what functions does the vendor perform?

RESPONSE:

Comcast objects to this Data Request as stated in its objections filed November 2, 2009. The identity of Comcast's vendors in New Hampshire is subject to confidentiality obligations to these third parties.

Subject to this objection: Comcast uses vendors to carry some non-local calls on Comcast's behalf, which may include the protocol conversion between IP and TDM.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-15a

Witness: David J. Kowolenko

REQUEST:

Regarding the Comcast testimony at page 20, lines 15-17;

What percentage of the calls remain "IP all the way" and do not traverse the PSTN, i.e. are "on-net" as opposed to "off-net?"

...

RESPONSE:

Comcast objects to this Data Request as stated in its Objections filed November 2, 2009. Without waiving those objections, and pursuant to data request instruction 9, Comcast notes that all of the "calls" described on page 20, lines 15-17 of its prefiled testimony "stay 'IP all the way' and do not traverse the PSTN."

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-15b

Witness: David J. Kowolenko

REQUEST:

Regarding the Comcast testimony at page 20, lines 15-17;

...

What percentage of calls are "off-net" calls?

...

RESPONSE:

Comcast objects to this Data Request as stated in its Objections filed November 2, 2009. Without waiving those objections, and pursuant to data request instruction 9, Comcast notes that all of the "calls" described on page 20, lines 15-17 of its prefiled testimony "stay 'IP all the way' and do not traverse the PSTN."

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-15c

Witness: N/A

REQUEST:

Regarding the Comcast testimony at page 20, lines 15-17;

...

Does the percentage of off-net calls to total calls in a particular area vary as the number of Comcast's customers for local voice service increase in that area? Please provide the basis for your answer, and provide copies of any studies or data that support this answer.

RESPONSE:

Comcast objects to this Data Request as stated in its Objections filed November 2, 2009.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-16a

Witness: David J. Kowolenko

REQUEST:

In its testimony at page 21, lines 7-8, Comcast states that its Cable VoIP service is essentially a software application.

On what device or devices does this software run?

...

RESPONSE:

Comcast's VoIP service is a compilation of various software applications; the core applications reside in the eMTA and in the soft switch functional elements (the call agent used for call processing, the signaling gateway used for signaling, and the media gateway used for PSTN and IP connectivity). Other software applications integrated in Comcast VoIP, in particular those used to operate the SmartZone web portal and the Universal Caller ID features, reside on servers throughout the Comcast network.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-16b

Witness: David J. Kowolenko

REQUEST:

In its testimony at page 21, lines 7-8, Comcast states that its Cable VoIP service is essentially a software application.

...

Does the customer purchase this software as a separate item?

...

RESPONSE:

No.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-16c

Witness: David J. Kowolenko

REQUEST:

In its testimony at page 21, lines 7-8, Comcast states that its Cable VoIP service is essentially a software application.

...

Is there a separate charge for the software?

...

RESPONSE:

No.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-16d

Witness: David J. Kowolenko

REQUEST:

In its testimony at page 21, lines 7-8, Comcast states that its Cable VoIP service is essentially a software application.

...

Is the software required before any voice calls can be initiated or terminated?

...

RESPONSE:

Yes.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-16e

Witness: David J. Kowolenko

REQUEST:

In its testimony at page 21, lines 7-8, Comcast states that its Cable VoIP service is essentially a software application.

...

Is the software required for the call management features?

...

RESPONSE:

Yes.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-17a

Witness: Beth Choroser

REQUEST:

In its testimony at page 21, line 15, Comcast states that it offers “wholly integrated services.”

Please provide a technical definition of a “wholly integrated service,” referencing any standards that govern such a service and the extent to which Comcast conforms to those standards.

...

RESPONSE:

Comcast did not purport to use a “technical definition.” The FCC has recognized that VoIP services may include a “suite of integrated capabilities and features” for managing communications. *See In re Vonage Holdings Corp. Petition for Declaratory Ruling Concerning an Order of the Minnesota Public Utilities Commission*, Memorandum Opinion and Order, 19 FCC Rcd 22,404 ¶ 7 (2004), *id.* ¶ 32. As described in Comcast’s testimony, CDV and BCV include substantially the same suite of capabilities and features as those at issue in the *Vonage* proceeding and are integrated to the same degree.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-17b

Witness: David J. Kowolenko

REQUEST:

In its testimony at page 21, line 15, Comcast states that it offers “wholly integrated services.”

...

Are wholly integrated services required to originate, terminate or complete a call?

RESPONSE:

Yes. While particular capabilities or features may not be invoked every time a customer makes a call, those capabilities and features are wholly integrated into Comcast's VoIP services. Comcast does not offer the mere transmission of voice messages separately from the integrated suite of communications capabilities and features that comprise the CDV and BCV services.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-18

Witness: David J. Kowolenko

REQUEST:

Regarding the Comcast testimony at page 24, line 11, when Comcast has a peering arrangement with other Cable VoIP service providers, do calls remain in IP format during the entire call? If not, please describe each protocol change.

RESPONSE:

Yes.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-19

Witness: N/A

REQUEST:

Please state whether Comcast has concluded that "cable home wiring" as defined in 47 CFR § 76.5(l) is customer premises equipment pursuant to 47 U.S.C. 153(14). Please also state the basis of any conclusion on this subject.

RESPONSE:

Comcast objects to this data request as stated in its objections filed November 2, 2009.

COMCAST PHONE OF NEW HAMPSHIRE, LLC

Docket No. DT 09-044

COMCAST'S RESPONSES TO FIRST SET OF NHTA DATA REQUESTS

Date Request Received: 10/23/09

Date of Response: 11/06/09

Request No. NHTA-Comcast 1-20

Witness: N/A

REQUEST:

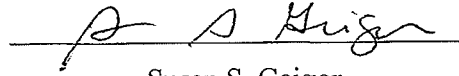
Please state whether Comcast has concluded that any Cable VoIP service facilities on the customer side of the demarcation that are not considered "cable home wiring" as defined in 47 CFR § 76.5(l) are or are not "customer premises equipment"? If so, what is the basis of this conclusion?

RESPONSE:

Comcast objects to this data request as stated in its objections filed November 2, 2009.

Certificate of Service

I hereby certify that a copy of the foregoing Responses to First Set of NHTA Data Requests has on this sixth day of November, 2009 been sent by electronic mail to persons listed on the Discovery Service List.



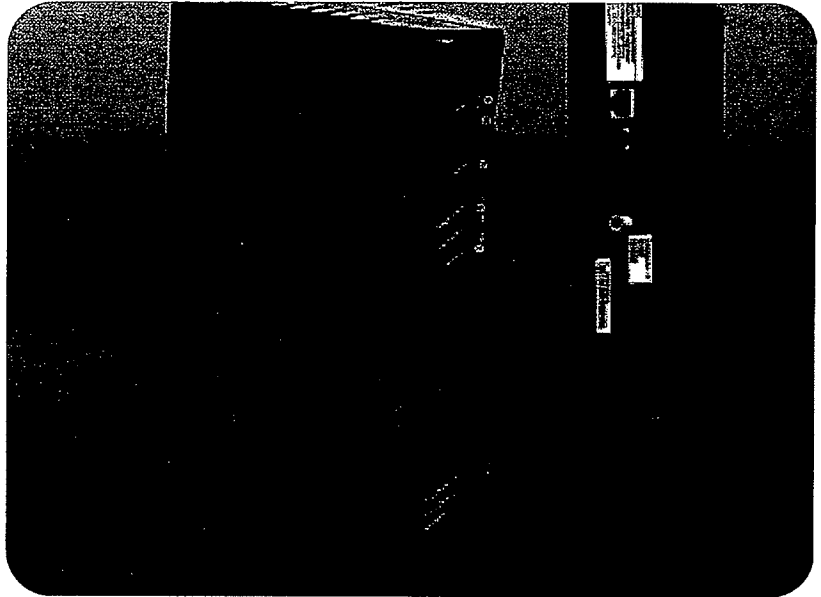
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ARRIS Touchstone®

Telephony Modem TM602G with Integrated Battery Back-up



ARRIS is pleased to release the Touchstone Telephony Modem TM602 as the next generation residential product family. Like the industry leading TM502 product family, the TM602 delivers two lines of carrier-grade Voice over IP (VoIP) along with High-Speed Data access. The TM602 maintains the same modem and battery form factors, but introduces two new battery options. The TM602 family offers the same product variants previously supported with the TM502 family.

Configuration

- DOCSIS® 2.0 and PacketCable™ 1.1/1.5 compliant design
- High Speed Internet via 10/100 Base-T Ethernet (RJ-45) or USB1.1 port
- Up to two lines of carrier-grade VoIP
- Firmware compatibility with legacy Touchstone TM402 and TM502 products – one load for new and legacy ARRIS Telephony Modems
- Simplified interoperability through PacketACE™ configuration file editor
- Multiple Protocol Support: PacketCable (NCS) and Session Initiation Protocol (SIP)

Performance

- Improved Line Card Performance over the industry leading TM502 – Greater than 20% increase in high loop current mode and 10% greater ringing voltage
- Loop Diagnostics for remote testing and troubleshooting of in-house wiring
- 1GHz Tuner – future proof toward future plant upgrades
- Toll grade, compression, and High Fidelity CODECs supported (High Fidelity supported in future firmware upgrade)

Leadership in Battery Technology

- More Battery Options – including the first and only 2-cell Li-Ion solution for up to 8-hours of standby battery hold time and a new 8-cell battery back for up to 24-hour of hold time!
- Firmware configurable battery management and reporting allows customization of operation parameters
- Boot from Battery – Operators or Subscribers can now boot the modem from a charged battery without needing AC Power.

Specifications

Physical:

Operating Temperature °F (°C)	41 to 104 (5 to 40)
Operating Relative Humidity (Min-Max)	5-85% (Non condensing)
Storage Temperature °F (°C)	-40 to 158 (-40 to 70)
Color	Dark gray
Dimensions (H x W x D) in. (cm)	8.6 x 2.1 x 7.1 (21.8 x 5.3 x 18.0) - excluding F-connector
Weight lbs (kg)	No battery included: 1.2 (0.54)
Battery: 4 Hour Back-up Option (Dark Grey Case)	
Backup Capacity	Lithium-ion 2.2 Ah
Battery Dimensions in. (cm)	1.2 x 1.85 x 3.1 (3.0 x 4.7 x 7.9)
Weight lbs (kg)	1.5 (0.66)
Battery: 8 Hour Back-up Option (Light Grey Case)	
Backup Capacity	Lithium-ion 2.4 Ah
Battery Dimensions in. (cm)	1.2 x 1.85 x 3.1 (3.0 x 4.7 x 7.9)
Weight lbs (kg)	1.5 (0.66)
Battery: 12 Hour Back-up Option	
Backup Capacity	Lithium-ion 4.4 Ah
Battery Dimensions in. (cm)	1.2 x 1.85 x 5.7 (3.0 x 4.7 x 14.5)
Weight lbs (kg)	1.7 (0.77)
Battery Storage Temperature °F (°C)	-4 to 140 (-20 to 60)
<i>Note: Storage above 77°F (25°C) will significantly reduce life of the battery and is not recommended.</i>	
Telemetry	AC Fail, Battery Low, Battery Missing, Replace Battery
Diagnostic LEDs	Power, DS, US, Online, Link, Telephone 1, Telephone 2, Battery

Interfaces:

RF Interface	External F-connector
Data Interfaces (bridged)	10/100 Base-T Ethernet (RJ-45 connector), USB 1.1 Series B connector
Telephony Interface	2 lines; RJ-14 ("Line 1/2"), RJ-11 ("Line 2")
Input Voltage (nominal)	100-240 Vac 50/60 Hz

Telephony:

Supervisory Voltage	48 Vdc nominal
Maximum Loop Length to CPE	1000 ft (457m) of 26 AWG (0.4 mm) wire
Ringing Load Capacity	10 REN total; 5 per line
Provisionable High Loop Current Mode	Yes (40mA constant current source, NA templates ONLY)
Telcordia™ GR 1089 (Lightning and Power Surge) Tested	Yes
Programmable Interface for Worldwide Applications	Yes (supports multiple country templates)

RF Downstream:

Frequency Range (MHz)	88-1002
Modulation (QAM)	64 or 256
Data Rate (Mbps) (Max.)	30 or 42
RF Input Sensitivity Level (dBmV)	-15 to 15
Bandwidth (MHz)	6

RF Upstream:

Frequency Range (MHz)	5-42
Modulation	QPSK, 8-QAM, 16-QAM, 32-QAM, 64-QAM & 128-QAM (S-CDMA only)
Data Rate (Mbps) (Max.)	up to 30.72
RF Output Level (dBmV)	A-TDMA: +8 to 54 dBmV (32-QAM, 64-QAM) +8 to 55 dBmV (8-QAM, 16-QAM) +8 to 58 dBmV (QPSK) S-CDMA +8 to +53 dBmV (all modulations)
Automatic Level Adjust	Yes
Gain Control Range (dB)	50
Frequency Stability (kHz)	±5
Output Impedance (Ohms)	75

Standards:

CODEC: G.711, 64 kbps, μ and A-law encoded speech
Enhanced CODEC firmware support (G.726, G.728, G.729E)
T.38 Fax Relay
DOCSIS 2.0 based
PacketCable 1.0 & 1.5 based
RFC3261 SIP: Session Initiation Protocol
UL® 60950, FCC Part, WHQL and USB-IF

Battery back-up times are typical and can be influenced by the age of the battery, the charging state, storage conditions and operating temperature as well as factors such as data activity and length of active telephone calls. The capabilities, system requirements and/or compatibility with third-party products described herein are subject to change without notice. The capabilities, system requirements and/or compatibility with third-party products described herein are subject to change without notice.

ARRIS Touchstone® Telephony Modem TM602G with Integrated Battery Back-up

Ordering Information

Part #	Description
721057	Touchstone TM602G/NA-0 DOCSIS 2.0 / PacketCable 1.0/1.5 Compliant E-MTA Integrated 100-240 Vac, 50/60 Hz Power supply with 6 foot power cord with NEMA 1-15 Includes Quick Install Guide, Ethernet Cable, USB Cable, and CD-ROM with Users Guide. NO battery included
721058	Touchstone TM602G/NA-4 DOCSIS 2.0 / PacketCable 1.0/1.5 Compliant E-MTA Includes 2-cell 2.2Ahr Li-Ion Battery Pack for up to 6 hours of battery back-up Integrated 100-240 Vac, 50/60 Hz Power supply w/ 6 foot power cord with NEMA 1-15 Includes Quick Install Guide, Ethernet Cable, USB Cable, and CD-ROM with Users Guide.
721059	Touchstone TM602G/NA-8 DOCSIS 2.0 / PacketCable 1.0/1.5 Compliant E-MTA Includes 2-cell 2.4Ahr, Li-Ion Battery Pack for up to 8 hours of battery back-up Integrated 100-240 Vac, 50/60 Hz Power supply w/ 6 foot power cord with NEMA 1-15 Includes Quick Install Guide, Ethernet Cable, USB Cable, and CD-ROM with Users Guide.
722011	Touchstone TM602G/NA-12 DOCSIS 2.0 / PacketCable 1.0/1.5 Compliant E-MTA Includes 4-cell 2.2Ahr, Li-Ion Battery Pack for up to 12 hours of battery back-up Integrated 100-240 Vac, 50/60 Hz Power supply w/ 6 foot power cord with NEMA 1-15 Includes Quick Install Guide, Ethernet Cable, USB Cable, and CD-ROM with Users Guide
721060	Touchstone TM602G/CE-0 DOCSIS 2.0 / PacketCable 1.0/1.5 Compliant E-MTA Integrated 100-240 Vac, 50/60 Hz Power supply w/ 6 foot power cord with CEE 7/16 "Euro" Power Plug Includes Quick Install Guide, Ethernet Cable, USB Cable, and CD-ROM with Users Guide. NO battery included
721061	Touchstone TM602G/CE-4 DOCSIS 2.0 / PacketCable 1.0/1.5 Compliant E-MTA Includes 2-cell 2.2Ahr, Li-Ion Battery Pack for up to 6 hours of battery back-up Integrated 100-240 Vac, 50/60 Hz Power supply w/ 6 foot power cord with CEE 7/16 "Euro" Power Plug Includes Quick Install Guide, Ethernet Cable, USB Cable, and CD-ROM with Users Guide
721062	Touchstone TM602G/CE-8 DOCSIS 2.0 / PacketCable 1.0/1.5 Compliant E-MTA Includes 2-cell 2.4Ahr, Li-Ion Battery Pack for up to 8 hours of battery back-up Integrated 100-240 Vac, 50/60 Hz Power supply w/ 6 foot power cord with CEE 7/16 "Euro" Power Plug Includes Quick Install Guide, Ethernet Cable, USB Cable, and CD-ROM with Users Guide
718003	Replacement 2-Cell, 2.2 Ah, Li-Ion Battery Pack for TM502G/H, TM602G/H, and TM504G/H
721944	Replacement 2-Cell, 2.4 Ah, Li-Ion Battery Pack for TM502G/H, TM602G/H, and TM504G/H
718005	Replacement 4-Cell, 4.4 Ah, Li-Ion Battery Pack for TM502G/H, TM602G/H, and TM504G/H
721192	8-Cell, 8.8 Ah, Li-Ion Battery Pack for TM602G/H and TM504G/H (Cannot be used in TM502G/H). Sold separately, no kitted TM602 option available

The capabilities, system requirements, and/or compatibility with third-party products described herein are subject to change without notice. ARRIS, the ARRIS logo, C3™, C4™, CableEdge™, Cadant™, C-COR™, CHP Max™, Cornerstone™, CXM™, DS™, Digicon™, Flex Max™, Keystone™, MONARCH™, n5™, nABLE™, NSM™, nVision™, PLEXIS™, Regal™, ServAssure™, TeleWire Supply™, Touchstone™, VoiceAssure™, and WorkAssure™ are all trademarks of ARRIS Group, Inc. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and the names of their products. ARRIS disclaims proprietary interest in the marks and names of others. © Copyright 2008 ARRIS Group, Inc. All rights reserved. Reproduction in any manner whatsoever without the express written permission of ARRIS Group, Inc., is strictly forbidden. For more information, contact ARRIS. 21 March 2008.

