ciency has been found or normal net-
work saturation has been attained. Net-
Stress was written for execution in the
VxWorks real-time operating system, but
could easily be ported to other operat-
ing systems.

This program was written by Kurt Leucht
and Guy Bedette of Kennedy Space
Center. For further information, contact the
Kennedy Innovative Partnerships Office at
(321) 861-7158.

Framework for Flexible
Security in Group
Communications

The Antigone software system defines
a framework for the flexible definition
and implementation of security policies
in group communication systems.
Antigone does not dictate the available
security policies, but provides high-level
mechanisms for implementing them.
A central element of the Antigone archi-
tecture is a suite of such mechanisms
comprising micro-protocols that provide
the basic services needed by secure
groups. Policies are implemented
through the composition and configura-
tion of these mechanisms. Mechanisms
are composed in different ways to ad-
dress new requirements and environ-
mental constraints. The Antigone frame-
work provides an easy-to-use application
programming interface (API), from
which secure group application pro-
cgrams can be built. Written entirely in
the C++ programming language, the sys-
tem consists of over 18,000 lines of
source code and has been ported to sev-
eral versions of Linux, FreeBSD, and
SunOS. Information for accessing re-
lated versions of the source code and re-
lated documentation is available at

This program was written by Patrick Mc-
Daniel and Atul Prakash of the University of
Michigan for Kennedy Space Center.

In accordance with Public Law 96-517,
the contractor has elected to retain title to this
invention. Inquiries concerning rights for its
commercial use should be addressed to:
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Refer to KSC-12207, volume and number
of this NASA Tech Briefs issue, and the
page number.

Software for Collaborative
Use of Large Interactive
Displays

The MERBoard Collaborative Work-
space, which is currently being deployed
to support the Mars Exploration Rover
(MER) Missions, is the first instantiation
of a new computing architecture de-
signed to support collaborative and
group computing using computing de-
vices situated in NASA mission opera-
tions rooms. It is a software system for
generation of large-screen interactive
displays by multiple users. The architec-
ture provides a platform and applica-
tions programming interface (API) for
the development of collaborative appli-
cations for NASA mission operations.
The standard deployment configuration
provides an integrated whiteboard, Web
browser, remote viewing and control for
collaboration over distance, and per-
sonal and group storage spaces that pro-
vide ubiquitous access and sharing of
data. Customization for specific domains
is provided through plugins. For the
MER mission, plugins include a flow-
charting tool for strategic rover opera-
tions and mission planning, 3D visualiza-
tion of the Martian terrain, a data
navigator to navigate the mission data-
base, and situational awareness tools.
The MERBoard software is designed to
run on large plasma displays with touch-
screen overlays, thus providing an im-
mersive and interactive environment for
teams to view, annotate, and share data.
The MERBoard overcomes the obstacles
to communication, retention, and col-
laborative modification of information
in diverse forms that can include text,
data (including images) from scientific
instruments, handwritten notes, hand
drawings, and computer graphics. The
MERBoard provides a unifying interface
for the integration of heterogeneous ap-
plications, and provides those applica-
tions with a consistent model for saving
and retrieving data. All applications may
be viewed and controlled from any loca-
tion that has a MERBoard. A personal
client provides integration of a user’s
personal computing environment with
the MERBoard environment.

This program was written by Jay Trimble,
Thodore Shah, Roxana Wales, Alonso Vera,
Irene Tollinger, Michael McCurdy, and
Dmitriy Lyubimov at Ames Research Cen-
ter. For further information, contact the
Ames Technology Partnerships Division at
(650) 604-2954.

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