



## Submission Form

### Respondent Information

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**Please attach this form to your submission.**

### **Questions:**

To assist you in shaping your views, we are particularly interested in the following questions.

#### **On connection**

What do you think of the new connection goal – is it ambitious enough?

What other key priorities in this focus area (if any) would you like to see considered?

How well do the identified challenges and actions contribute to achieving the priorities?

What other specific challenges and actions (if any) do you think should be considered? By whom and by when?

#### **On confidence**

What do you think of the new confidence goal – is it ambitious enough?

What other key priorities in this focus area (if any) would you like to see considered?

How well do the identified challenges and actions contribute to achieving the priorities?

What other specific challenges and actions (if any) do you think should be considered? By whom and by when?

#### **On content**

What do you think of the new content goal – is it ambitious enough?

What other key priorities in this focus area (if any) would you like to see considered?

How well do the identified challenges and actions contribute to achieving the priorities?

What other specific challenges and actions (if any) do you think should be considered? By whom and by when?



## On collaboration

How important do you think collaboration across sectors is to achieving our digital potential?

Apart from the ones already identified, what other collaboration partners or sectors (if any) are vital to achieving our digital potential?

What unique contribution do you see for Māori, for communities, for business groups, for local government, for researchers or for other contributors you identify as having a key role?

What would you like to see the overarching sector forum focus its work programme on?

## On achieving our digital potential

Using digital technology, what contribution will you make to improving our productivity (achieving a creative, knowledge-based, high-income economy)?

Using digital technology, what contribution will you make to enriching and valuing New Zealand communities and cultures, and promoting our unique national identity?

Using digital technology, what contribution will you make to achieving sustainable growth as a nation?

What contribution do you think others need to make to achieve our digital potential?

## Other comments

Do you have any further suggestions or comments?

Post to            Digital Strategy 2.0 Submission  
                      Digital Development Group  
                      Ministry of Economic Development  
                      P O Box 1473  
                      Wellington

Email to           [submission@digitalstrategy.govt.nz](mailto:submission@digitalstrategy.govt.nz)

Fax to             04 499 0969

**Submissions close on 12 May 2008 at 5:00pm.**

## Confidentiality and the Official Information Act

*Respondent should note that written submissions or comments provided to the Ministry of Economic Development on the Draft Digital Strategy 2.0 will be subject to the Official Information Act (OIA) 1982. The OIA requires information to be made available unless there is good reason, pursuant to the Act, to withhold the information and that good reason outweighs the public interest in making the information available.*

*If you want information that you provide to be treated as confidential, please clearly identify the material and explain to us why you believe the information should be withheld under the provisions of the OIA.*



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## Broadcast Digital Audio and the Draft Digital Strategy Draft Digital Strategy - Content.

Whilst the Draft Digital Strategy, identifies key and important challenges and recognizes positive aspects of Digital Content, it does not fully address how content is created and processed. This paper provides an example of digital content – the digital broadcasting of television audio – and shows how the consideration of the key principles of the Draft Digital Strategy is imperative to ensure that New Zealand maximizes the opportunities presented by new digital formats. Broadband/high connection speeds provide the enabling technology for the delivery of high definition content. However, delivery is only part of the story. The emphasis on delivering high quality television programming is driven by the expectations of our customers, viewers and by Digital Strategy itself. There needs to be a unified effort to ensure the production and completion of consistently high quality content. In part, this can be achieved through international collaboration, knowledge sharing and training programmes. The Draft Digital Strategy talks about “achieving our digital potential” and the digital broadcasting of television audio is an area where New Zealanders could be world leaders.

In the case of content for television; operator skills, equipment and technical standards play a pivotal role in the creation and completion of digital broadcast television audio. This raises a number of questions around whether the New Zealand broadcasting industry is fully prepared for the digital broadcasting of television audio:

- Will New Zealand produced television content be technically comparable to other nations?
- Will the technical standards of other nations be compatible with NZ television?
- Do NZ television broadcast facilities have the technical equipment and trained staff?
- Will existing broadcasting issues continue, be eliminated or become more severe?
- How can World Class ideas and processes be assimilated into the NZ industry
- Is there a need for a national broadcasting audio standard for ensuring quality and consistent audio transmission across all NZ broadcast networks?

### Introduction – Understanding Broadcast Audio

The manipulation of Digital Content is straight forward; the concept of “Drag & Click” is fairly well understood and applies to media stored as digital data and controlled via a computer. However, in the professional arena, the process of content delivery is often misunderstood, especially in the areas of content management and processing.

### Production

In all professional aspects, audio is mostly recorded and then stored in a



digital format. Recording devices vary from hard-disk recorders (as in film) to video tape; analogue recording devices have now become largely obsolete. For television the audio is recorded as digital data and paired with video on a digital tape format. Drag and click principals do not apply with digital video tape formatted storage. As part of their technical specifications, many networks insist that video be recorded to a specific professional video tape format. The audio is recorded to that video tape in a digital form and completes the production phase. New technology exists where video and audio are recorded to hard-drives, but storage is limited and expensive and thus prohibitive for longer form projects. No video and audio manipulation, processing or editing is performed at this point.

#### Post-Production

Post-production starts with digitizing video and audio together, and in sync, to a computer for video editing. Now the raw digital data exists as separate video and audio files and those files can be managed and processed with ease by a skilled operator. Once the video (with sync audio) has been edited the project is exported by proprietary software, most frequently an OMF file (Open Media Framework) is created that contains the entire technical project information and audio data within it, so that audio post-production can begin. Until this point, no audio processing has been performed, only editing, where unwanted audio is discarded.

Although many software platforms exist where audio can be further edited and processed, there are only a handful of software programmes that are accepted as an international industry standard, most notably, "Pro-tools". (Consumer software often lacks in reliability, resources or in file management to handle large projects of extreme file sizes.) On Mix completion, where the Mixer has created a subjective and compliant to Network Technical Specifications mix, the final audio is transferred to the edited master tape, (created by the on-line video editor) syncing to picture. Network delivery requirements mandate the video tape format, and in recent times and with the acceptance of digital video, the format that has become widely used is the Digi-Beta tape format. Costing around US\$40k the Digi-Beta machine has provided a reliable platform that also has the capability of recording 4 separate tracks of audio.

#### Digital Data

The ability to transmit digital information has altered the scope of what the broadcast networks can deliver to the viewer. Dolby Stereo, 5.1 Surround and other consumer formatted encoded audio data, including Meta-Data can be received in the home. Meta-Data contains information for digital decoding boxes to automatically adjust the audio levels of an incoming TV show so that volume variances are minimized. All of which add value to the digital transmission of broadcast audio. In addition to the cost of actually mixing in surround sound, this process comes at a price. Various data streams need encoding, the data needs to be stored with the video and 4 tracks of audio (Digi-beta) are not enough. More audio tracks are required along with a video tape machine that can record and playback high quality digital video is needed.

Digital Video tape Recorders (DVR's) are expensive to purchase and many U.S networks are insisting that completed digital television shows be delivered to them on HDCAM-SR. (US\$88k base price) This represents an enormous investment for any post-production facility or network and forces small post-production facilities to out-source.

In addition to having the superior MPEG4 video format, the HDCAM-SR



has the capability to record 12 Tracks of audio which make it ideal for 5.1 surround sound mixing. It also offers the commissioning network the opportunity to have multiple audio configurations stored on the tape e.g. the six 5.1 audio tracks, stereo, and digitally encoded Dolby surround data. Normally additional audio elements and “Stems” are provided on separate and accompanying media. The Sony HDCAM-SR is fast replacing the Dig-beta as an industry standard. Other machines do exist with similar capabilities and costs, but have yet to be adopted as a standard.

#### Cost

Since DTV offers subscribers the opportunity to listen to 5.1 Dolby Surround if it exists, then so too the opportunity exists for producers to create television shows in 5.1 surround. The equipment and expertise required to create a 5.1 mix is different than the equipment used to create a Dolby Stereo mix. In NZ this knowledge is limited and many studios lack all the equipment. Generally producers find 5.1 surround mixing to be cost prohibitive and not all television shows benefit from the surround feature such as reality programming. However through the introduction of DTV additional costs are passed on to the producers making the digital process more expensive. Final edited-master video tapes must be delivered on a digital format tape and they must be digitally encoded for digital transmission. Post-Production Sound Mixing for a digital delivery requires a more considered and responsible approach as no audio processing is performed during the transmission of digital data. This equates to more time and money spent in audio post-production

#### Transmission

Initially, it is expected that NZ producers will be providing content to the broadcaster in a non-encoded digital format. The uplink transmission process will encode the audio signal to the appropriate digital format for the consumer decoding box to receive. It is unlikely that the broadcaster will have the capability to create an encoded 5.1 surround data stream or relevant meta-data from the appropriate and supplied audio mix. While Dolby (5.1 surround or Dolby Stereo) decoding is available on most respected black-box consumer decoders the viewer will receive only basic stereo, unless the programme audio has been Dolby E encoded (Dolby Digital Encoding) from an outside source.

#### Internet Audio

In contrast, audio for the internet can be controlled, manipulated and processed with relative ease by consumer software and by people with little audio skill or knowledge. No international standards exist to maintain audio consistency throughout the internet and none likely to be created in the foreseeable future. The integrity of audio files can be easily altered so that they can sound distorted, muffled or generally be unpleasant to listen too. Ultimately the final stage and decision making process in broadcasting television audio over the internet lies with the I.T department. Crucial decisions about file size or file compression are made not by the sound department or the post-production facility, but by the programmer. As experienced by the BBC, the internet broadcasting of television shows has had a dramatic and unpleasant affect on bandwidth. The BBC has met with criticism and many people feel the time is not right to have television programming be available for download or be broadcast via the internet until the bandwidth is improved significantly.

#### Conclusions – Achieving our Digital Potential

Whilst digital broadcasting opens up a wide number of opportunities, it is



imperative that the issues, costs and associated training requirements for the production of different content formats are well understood. To achieve our digital potential in this area as New Zealanders, we believe the best way forward would be to carry out a national Roadshow providing a series of facilitated workshops for broadcasting teams throughout NZ – “Making the Most of Digital”. This would combine the elements of community, collaboration, confidence and content as described in the Draft Digital Strategy.

In parallel, the authors suggest creating a NZ broadcast television audio standard, enlisting a wide group of stakeholders representing all parts of the NZ broadcasting industry. This new Standard would be the backbone of the NZ digital television industry and would provide industry sectors with guidelines for maximizing quality, help eliminate subjectivity and ensure consistent television audio creation and transmission across NZ.

## **Attachment 2:**

### **Digital Strategy & Broadcast Television Audio Introduction**

The scope of this brief paper is to identify some of the consequences of introducing Digital Broadcasting into New Zealand and to thereby assist in the ongoing development and implementation of the Digital Television Strategy as it relates to broadcast television audio.

#### **Understanding the Current Issues**

The effects of Analogue Switch Off (ASO) in the broadcast television industry has far reaching implications and is not often understood, even by industry professionals. The lack of communication and knowledge sharing between individual industry sectors is well known and accepted, and not unique to NZ alone. Emerging technologies specific to operator skill sets and operational procedures create isolation, even across the hallway. While ASO poses new challenges to the broadcast industry, old issues will still remain and need to be addressed.

There are five main stakeholder groups in the broadcasting industry, as follows:

- Commissioning Networks
- Producers
- Production
- Post-Production
- Broadcasting/Transmission

Each group contributes to the completion of the broadcast media and performs their work, frequently without the consultation or advice of its preceding group. In some cases the boundaries are blurred and indistinct, passing issues on to the next stage for others to deal with. With the audio component, the affects of this siloed approach can be heard as poor quality programme audio marred by undesirable noise, distortion or even unacceptable Sound Mixes. The final process stage is transmission. Safeguards have been created to prevent equipment from broadcasting inferior audio levels but this too can compromise the audio intelligibility and the sound quality the viewer hears at home. The process of broadcasting a television show where the audio has been “Digitally Encoded” (which is becoming an international standard) is slightly different from the process of broadcasting analogue audio. During the digital transmission of a digitally formatted show, no audio safeguards are in-line to maintain and control the broadcasting of unacceptable audio levels. This is called “Pass Through”. In contrast, television programmes delivered in an analogue format for digital transmission will go through a final safeguard process, and audio levels can be controlled before the transmission



reaches the viewers. If consumers experience volume variances at the television set under the present analogue broadcast system, then they can expect to hear greater and more disturbing volume levels under the new digital system. It doesn't mean that digital broadcasting is bad; it only highlights errors and tolerances not normally heard in the analogue system. Identifying and addressing the communication breakdown between broadcasting groups is the key issue.

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The commissioning Networks issue Technical Delivery Requirements or Technical Specifications to producers. Post-production technical operators use this information to provide a completed product that is intended to be network compliant. Generally the audio production crew do not receive this information and record audio to the technical specifications of the equipment they use in the field. Since the post-production operators receive the audio after it has been recorded, it is unlikely that they can contribute to the quality of the location recordings. It is difficult and expensive to repair audio compromised in the field, and not always possible.

Prior to transmission, the Network monitors the quality of a completed show through a quality control check, (QC) where a "Pass" indicates the programme is compliant. In the event of a "Fail" the programme is returned to post-production and repaired. Once the network has accepted the programme it is scheduled for broadcast and enters the transmission phase.

Except for the producers, the various sectors do not communicate to each other. The producer's responsibility lies in passing relevant information on, when and if it becomes available to them. Although most skilled producers do have a basic technical understanding of the entire process, they generally rely on their crew, operators and staff to inform them of any issues that may arise that could affect the quality of their programme. Once the completed show has been delivered (Analogue format) to the network, the digital encoding or transmission stage can still alter final audio levels and sonic quality without the knowledge or consent of the producer.

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This becomes relevant for the following scenarios.

1. Where the completed show is not compliant with the Delivery Requirements.
2. During transmission, the in-line audio processing equipment is not calibrated and aligned correctly to the network's own Technical Delivery Requirements.
3. Where transmission engineers feel they can further improve audio levels by inserting additional processing.

### **Addressing the Issues**

To avoid a continuation of existing broadcasting issues after ASO and to build on the benefits of New Zealand's Digital Strategy, the following areas should be addressed, by the key industry stakeholder groups, as follows:

Networks should be asked to:

1. Provide their content providers with standardized "Technical Delivery Requirements". The specifications should be identical for every network and reflect the application and use of new technologies.
2. Mandate that all television programmes be delivered in a pre-determined digital format.
3. Improve the accuracy of the Quality Control process and ensure that all content is fully compliant.

Producers should be asked to:

1. Issue copies of the Technical Delivery Requirements to all Technical crew.
2. Ensure that they hire competent crew and use appropriate facilities.
3. Support production staff, listen to, and implement recommendations.

Production staff should be asked to:

1. Fully understand their role in recording the highest quality audio free from distortion and other undesirable elements.



2. Without reservation, communicate effectively to producers and post-production staff.

3. Meet post-production requirements for information and output format, where possible.

Post-production staff should be asked to:

1. Fully understand their area of responsibility which is to complete the Audio Mix that is consistent with standard international practises and operational procedures.

2. Show competence in understanding and implementing Technical Delivery Requirements.

Transmission staff should be asked to:

1. Not alter the audio integrity of any audio, prior to encoding or transmission.

2. Ensure that analogue processing equipment is calibrated correctly to Network Specifications and monitored.

3. Monitor and adjust incoming satellite programme feeds to ensure the audio levels are correct and compliant.

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### **Benefits of a NZ National Broadcasting Standard**

The adoption of a national standard for all broadcast networks should be encouraged. Digital technology has been part of the post-production process for many years and has been constantly improved and refined. New technologies exist to aid in the audio completion of television programming and these technologies should become part of a revised and complimentary NZ Technical Standard. New technical specifications need to be clear to understand, be easy to meet compliance and remove all subjectivity that presently exists in the Delivery Requirements of New Zealand broadcast networks.

### **Informing the Industry**

It won't be sufficient to put in place a standard or stakeholder guidelines to address the current issues. There needs to be accompanying communication to ensure that all stakeholder groups are aware of what needs to change. In particular, through discussion and interaction, each industry group should be informed of,

- Their controllable responsibilities.
- The responsibilities of other stakeholder groups
- Limitations and grey areas that need to be addressed
- New and successful operational techniques and practises that have been employed in other countries.

Informing the broadcast industry is a priority. Understanding Digital Strategy and Broadcast television audio is paramount to the success of New Zealand's Digital programme. Industry sectors need to make informed decisions, collaborate and work together. The successful series of NZ Workshops, funded and sponsored by NZ Trade & Enterprise, called "Tuning into Hollywood" was the start. This paper proposes a follow up series of workshops, weighted towards industry professionals and supporting the Digital TV Strategy and the Draft Digital Strategy, that covers all the above listed sectors and topics. This would also garner support and impetuous for the development of a national broadcast television audio "Technical Delivery Requirements" standard for New Zealand. These workshops would be held in all major towns across NZ, to not only provide information and training for the various stakeholder groups within the broadcasting sector, but also to involve the community of NZ viewers.

### **Further Information**

For more information please contact:

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